

Science Sight

Teacher Manual



Class 7

Class-7

Chapter-1 Nutrition in Plants

Exercise

- A.** 1. (a) 2. (b) 3. (a) 4. (d)
5. (d) 6. (d)
- B.** 1. kitchen 2. balance 3. manure
4. Parasites 5. nitrogen 6. phloem
7. Manures
- C.** 1. (c) 2. (e) 3. (d) 4. (b)
5. (a)
- D.** 1. F 2. T 3. F 4. T
5. T 6. T
- E.** 1. Carbon dioxide, water, sunlight and chlorophyll is required for photosynthesis.
2. The green pigment present in leaves is called chlorophyll.
3. Products of photosynthesis are glucose and oxygen.
 Carbon dioxide + water $\xrightarrow{\text{sunlight}}$ Glucose + oxygen.
4. Lichens show symbiotic relationship.
5. Plants require nitrogen, phosphorus, potassium for proper growth.
6. Stomata helps in exchange of gases. i.e, carbon dioxide and oxygen.
7. Alga and fungus.
- F.** 1. Photosynthesis is very important for life on Earth because the two basic requirements for life on earth, food and oxygen are both produced by plants.
2. Insectivorous plants trap, kill and digest insects. These are green plants which can make their own food, but they gain some of their nutrition from insects trapped by the plants themselves. They trap insect to get nitrogenous compounds without manufacturing them. For example- Sundew, venus flytrap, Pitcher Plant and Bladderwort.
3. Saprophytic plants feed on dead and rotting materials. Two examples of saprophytic plants are mushrooms and moulds. These non-green plants first release digestive juice which act on the dead and decaying matter, converting it into simple sugars which are absorbed by saprophytes.
4. Rhizobium bacteria lives in the root modules of certain leguminous plant such as peas. It converts atmospheric nitrogen into usable form, example ammonia for the plant. The plant in return provides food and shelter to the bacteria.
5. Farmers can replenish soil nutrients by following two ways:
 • Addition of manure: They are rich in essential nutrients and humus. This is added to enrich the soil with vital nutrients that plants requires.
 • Addition of fertilisers: They are rich in nitrogen, phosphorus and potassium. Soil deficient of any particular nutrient get replenished with that nutrient.
6. During photosynthesis, the leaves containing chlorophyll, in the presence of sunlight, use carbon dioxide and water to synthesis glucose sugar. During this process, oxygen is released by plants into the atmosphere. Plants use some

sugar for its growth and to repair worn out cells. The glucose gets converted into starch and is stored in different parts of the plant body.

Diagram: Do it yourself.

7. In venus flytrap, insects are lured by the nector into the jaw like leaf trap of the plant. Once the insect sits on the leaves. The jaw's clamp shut and the insect is trapped in it. The plant immediately secretes digestive juice that first drawn and then dissolve the insect.

HOTS

1. Insectivorous plants are called partial hetrotrophs because they can make their own food but they gain some of their nutrition from insects.
2. There is no need for farmers to add nitrogen containing fertilisers to the soil in which leguminous plants are grown because they share symtiotic association. So farmers grow these plants alternatively with other crops, this restores the nitrogen content of the soil which was used up by the earlier crop.

Life Skills

Do it yourself.

Chapter-2 Nutrition in Animals

Exercise

- A.** 1. (b) 2. (a) 3. (a) 4. (d)
5. (d) 6. (d)
- B.** 1. Ingestion 2. teeth 3. stomach
4. small intestine 5. cud
- C.** 1. Amoeba engulfs its food by slowly wrapping its finger like projections (called pseudopodia) around the food.
2. Hydrochloric acid provides an acidic medium for pepsin to eat. In additon, it also kills the bacteria that could have entered with the food.
3. When the liquid chyme enters small intestine, bile itself breakdown carbohydrates into simple sugar such as glucose, proteins into amino acids and fats into fatty acids and glycerol.
4. The stomach of ruminants has four chambers-rumen, reticulum, omasum and abomasum.
5. Saprophagous animals feed on dead and decaying matter of animals and plants in the soil. Earthworms are sprophagous animal.
- D.** 1.
 - The steps involved in the process of nutrition are: Ingestion, digestion, absorption and egestion.
 - Ingestion- Amoeba engulfs its food slowly wrapping its psudapodia around the food. The portion of the cell that cantains the food and little water is known as food vacuole.
 - Digestion-The food is digested inside the food vacuole. The digestive enzymes are secreted into the vacuole from the surrounding cytoplasm.
 - Absorption- The digested food diffuses into the surrounding cytoplasm, and is used for energy, growth and repair.
 - Egestion- The undigested food is expelled out of the body at any point because it has no anus.

2. Digestion is the process by which the complex insoluble food is broken down into simple soluble food substances.
 - Saliva moistens the food and makes the chewed food slippery.
 - Bile and pancreatic enzymes breakdown carbohydrate into simple sugar. Such a glucose, preteins into amino acids and fats into fatty acid.
3. Four functions of stomach are:
 - (i) The food in the stomach is churned and acted upon by its digestive juice.
 - (ii) Pepsin digests the proteins present in food into simple substances.
 - (iii) Hydrochloric acid present in stomach kills the bacteria that could have entered with the food.
 - (iv) Mucus present in stomach prevents hydrochloric acid from damaging the stomach.
4. The small intestine absorbs all the nutrients produced by the breakdown of carbohydrates, protein and fats. The wall of the small intestine has numerous tiny finger-like projections called the villi. These villi increase the surface area for absorption so that the digested food is easily absorbed.
5. Diagram- Do it yourself.
6. Four types of teeth are found in man-Incisors, canines, molars, and premolars. Their functions are as follows:
 - Incisors- These are used to cut and bite food.
 - Canines- These are pointed and sharp to hold, cut and tear the food.
 - Premolars- These are used to crush and grind the food.
 - Molars- They have flat surfaces to grind the food.

HOTS

1. Place a bitter pill at the tip of the tongue to prevent tasting most of the bitterness because back of the tongue has the sense of bitter taste.
2. The better method to clean the tongue is to use a plastic tongue clean. Using a tongue cleaner is more hygienic as it will prevent trapping additional bacteria in bristles of your toothbrush.

Life Skills

Do it yourself.

Chapter-3 Fibre to Fabric

Exercise

- | | | | | |
|-----------|--|--------|--------|--------|
| A. | 1. (a) | 2. (c) | 3. (b) | 4. (a) |
| | 5. (a) | 6. (c) | | |
| B. | 1. F | 2. T | 3. F | 4. F |
| | 5. F | | | |
| C. | 1. (d) | 2. (a) | 3. (b) | 4. (e) |
| | 5. (c) | | | |
| D. | 1. Silk is obtained from silkworm whereas wool is obtained from sheep. | | | |
| | 2. Breeding of sheep is done to obtain wool, such breed of sheep which yield good quality wool in large quantities is called 'selective breeding'. Breeding is done in winter. | | | |

3. Rearing of silkworms for obtaining silk is called sericulture.
 4. Characteristics of silk fibres are:
 - It has a smooth and soft texture.
 - It is the strongest natural fibre.
- E.**
1. The lifecycle of silkworm is completed in 4 stages. eggs, caterpillar, pupa and moth. The female silkworm lays 300 to 400 eggs at a time. The female dies immediately after laying the eggs. The larvae hatch in about 10 days. Once hatched larva feeds on mulberry leaves for 3-4 weeks. Larva eats voraciously and grows fast. Once it achieves its maximum growth, it stops eating, changes its colour and attaches itself to twig. At this stage, it called pupa. Pupa starts spinning a cocoon. In cocoon stage, caterpillar cover itself with silk fibres. The formation of cocoon, takes about a weeks time. Further development of moth continues inside the cocoon.
 2. The steps involved in processing of wool are:-
 - Shearing- The process of removing fleece using special clippers.
 - Scouring- The sheared fleece of sheep has dust, dirt, oil etc so they are cleaned and washed with detergents.
 - Sorting- Process of segregating long fine quality fleece from the less fine quality which are broken into small pieces.
 - Combing- Hair are sent into carding machine and combed into a sheet.
 3. Steps involved in silk production are:
 - Rearing of silkworm to obtain cocoon- Silkworms eat day and night and grow big in size. After about 25 to 30 days, silkworm stops eating and get ready to spin cocoons. Silkworm climb the twigs placed near them and spin cocoons of silk fibres. Silkworms enclose themselves completely inside the silken cocoon in two or three days.
 - Process of cocoons obtain silk fibre: The pile of cocoon is placed in hot water. Hot water makes the silk fibre of cocoon to separate out. The long silk fibres are obtained by unwinding the thread from cocoon.
 - Converting silk fibres into silk cloth- Silk fibres obtained from cocoons are spun to form silk thread called silk yarn. This is then woven on looms into silk cloth by weavers.
 4. **Uses of silk:**
 - It is used to make clothes, scarves and dresses.
 - It is used in bullet-proof vests and in parachutes.
 - It is used as non-absorbable sutures in surgery.
- Uses of wool:**
- Wool is used to make woven clothes that keep us warm in winters.
 - It is also used to make carpets. Wall fabrics, bedsheets etc.

Hots

1. Different type of silk is obtained from different moths because there is a variety of silk moths which look very different from one another.
2. To make silk, the cocoon of the silk worm is boiled in water and as a result the worms die in the process of making silk.

Hence, animal protection groups are against it.

Life Skills

Do it yourself.

Chapter-4 Temperature and Heat

Exercise

- A.** 1. (b) 2. (c) 3. (d) 4. (d)
- B.** 1. Two temperature scales that are commonly used are-celsius scale and fahrenheit scale.
2. Two characteristics of clinical thermometer are- The bulb is filled with mercury and there is a little arrow showing normal body temperature.
3. There modes of transfer of heat are- conduction, convection and radiation.
4. a) Because hot water is lighter than cold water, it rises up carrying the heat energy with it and cold water being denser falls to bottom and gets heated in turn. This process continues and whole water gets heated.
- b) Places close to sea have moderate temperature because of the heat capacity of the ocean.
- C.** 1. Do it yourself.
2. Activity-
- Connect a bulb to a metal wire.
 - Connect wire's end to a battery.
- You will see that the bulb will glow which shows metal is a good conductor of electricity.
- Now take a wollen scale instead of metal
 - The bulb will not glow.
3. If the vessel containing water is kept on a flame the water at the bottom of the vessel gets hot and as hot water is lighter than cold water it rises up and cold water being dense falls down, then it gets hot and the process continues. This shows that heat is transferred by mass movement of the liquid.
4. Application of radiation
- Room heaters
 - Solar panels
- D.** 1. 23°F
 $= 5/9 (23-32)$
 $= 5/9 (-9)$
 $= -5^{\circ}\text{C}$
2. 95°C
 $= 95 \times 9/5 + 32$
 $= 171 + 32$
 $= 203^{\circ}\text{F}$

HOTS

1. Room heaters having a fan blowing air works on the principle of convection whereas room heaters having a heating coil and reflector works on the principle of radiation.

Life Skills

Do it yourself.

Chapter-5 Acids, Bases and Salts

Exercise

- A.** 1. (a) 2. (c) 3. (b) 4. (c)
5. (b)
- B.** 1. Acetic 2. Bases 3. Baking soda
4. alkalis 5. citric 6. Indicator
- C.** 1. F 2. T 3. F 4. F
5. F
- D.** 1. (c) 2. (e) 3. (a) 4. (b)
5. (d)
- E.** 1. Unripe green apples - Tartaric acid
vinegar - Acetic acid
tea - tannic acid
sour milk - lactic acid
orange - citric acid
2. a) Sulphuric acid - H_2SO_4
b) Nitric acid - HNO_3
c) Caustic soda - NaOH
d) Sodium bicarbonate - $NaHCO_3$
3. Bases are substances that are bitter to taste and soapy to touch.
4. Indicators are substances that are used to test whether a substance is acidic or basic in nature for example, litmus paper, china rose, methyle orange etc.
5. Acid turns blue litmus paper red.
6. pH paper is used to test the strength of an acid or a base.
7. Sodium chloride is obtained when HCL and NaoH reacts.



8. Neutralisation is a type of chemical reaction in which a strong acid and a strong base react with each other to form salt and water. Indigestion takes place due to too much hydrochloric acid present in stomach, to nutralise this acid, antacid tablets are taken.
9. Salts are the compounds that are formed by the reaction of an acid with a base.

Uses of Salt:-

- It is used to preserve raw fish and meat.
- Common salt is used in large amount as table salt.
- Washing soda is used in manufacturing of detergents.

- Baking Soda is used for making of baking powder.

Salts used in laboratories are: white vitriol, blue vitriol, baking soda etc.

- F. 1. Indicators are substances that are used to test whether a substance is acidic or basic. Litmus and Methyl orange are two acid- base indicators.

2. a)

Acid	Alkalis
<ul style="list-style-type: none"> • It is watery to touch. • It is sour in taste. • It turns blue litmus red. • For example: Acetic acid, citric acid. 	<ul style="list-style-type: none"> • It is soapy to touch. • It is bitter in taste. • It turns red litmus blue. • For example: Sodium carbonates, Sodium hydroxide.

b)

Organic Acid	Mineral Acid
<ul style="list-style-type: none"> • Acids produced by plants and animals are known as organic acid. • For example: Citric Acid, Lactic Acid 	<ul style="list-style-type: none"> • These are prepared in laboratories and corrosive in nature. • For example: Nitric acid, Sulpheric acid

c)

Base	Alkali
<ul style="list-style-type: none"> • All bases are not soluble in water. • All bases are not alkali. • For example: Metal oxides. 	<ul style="list-style-type: none"> • All alkalis are soluble in water. • All alkalis are bases. • For example: Sodium hydroxide.

3. Litmus is obtained from lichens that is why it is called natural indicator. There are two types of litmus paper- red and blue.
The blue litmus paper is turned into red in presence of an acid and the red litmus paper turns blue in presence of base.
4. Excessive use of chemical fertilizers make the soil acidic. When the soil is too acidic, it is treated with bases like quick lime and if the soil is basic, organic matter is added to it. Organic matter releases acids which neutralize the basic nature of the soil.
5. When we eat sweets or sugary food, large amount of acid is produced in the mouth, The excess acid is removed by cleaning the teeth with toothpaste which is alkaline in nature.
6. Fire extinguisher contains a bottle of sulphuric acid and a solution of sodium bicarbonate. In case of fire, plunger struck is broken out. When the acid mixes with sodium bicarbonate solution neutralisation reaction takes place. As a result of neutralisation, carbon dioxide produced under high pressure gushes out on the fibre and fire is brought under control since carbon dioxide does not support burning.

HOTS

If we are provided with two colourless solutions, we can test them with litmus paper, if a solution turns blue litmus paper red then the solution is acidic, if it turns red litmus blue it is basic.

Life Skills

Do it yourself.

Chapter-6 Physical and Chemical Changes

Exercise

- A.** 1. (d) 2. (d) 3. (c) 4. (d)
5. (a)
- B.** 1. New substances 2. ice 3. new 4. Corrosion
- C.** 1. Physical change 2. Chemical Change
3. Physical change 4. Chemical change
5. Precipitate
- D.** 1. Two example of desirable chemical change are: Photosynthesis and respiration.
2. Conditions necessary for rusting are: oxygen and water.
3. Three methods used to prevent rusting are: greasing, galvanisation and electroplating.
4. Dissolution of salt in water is physical change because this is a reversible change, we can separate salt from water by the process of crystallisation.
- 5.
- | Physical Change | Chemical Change |
|--|---|
| <ul style="list-style-type: none">• No new substance is formed.• They can usually be reversed.• For example: melting of ice. | <ul style="list-style-type: none">• New substances is formed.• cannot be reversed.• For example: burning of candle. |
6. When an iron is left in damp air for a considerable time, it gets covered with a red brown flaky substance called rust. This is called rusting of iron. Four ways for prevent rusting are: greasing, galvanisation, electroplating and alloying.
7. a) Evolution of gas-burning of paper
b) Change of colour- corrosion
c) Change of state- electrolysis of water
- E.** 1. Most of the chemical changes are reversible because new substance is formed. When particles undergo change in their composition, new substance is formed which can not be reversed back.
2. We can separate crystal of sugar from sugar solution by the process of crystallisation. During this process, the water from the solution is evaporated to get crystals. Water turns into water vapour and crystals of sugar are formed.
3. Four properties of physical change are:
 - It is reversible.
 - Change in shape.
 - Change in size.
 - Change in state.

4. Four properties of chemical change are:
 - Change in colour
 - Evolution of gas
 - Change in smell
 - Formation of solid
6. Such reaction in which heat is evolved are called exothermic reaction whereas reaction in which heat is absorbed are called endothermic reaction.
7. Electroplating is done to prevent rusting. Iron objects are coated with a layer of less reactive metal like chromium by electrolysis.

HOTS

1. Rusting could be greater problem in Mumbai because it rains heavily in Mumbai and water and oxygen are main requirements for rusting.
2. Burning of LPG involves both physical and chemical changes because when LPG comes out of cylinder and is converted from liquid to gaseous state it is a physical change. When the gas burns in air it is a chemical change.

Life Skills

Do it yourself.

Chapter-7 Weather, Climate and Adaptation

Exercise

- A.**
1. (d)
 2. (b)
 3. (d)
 4. (a)
 5. (b)
- B.**
1. F
 2. T
 3. T
 4. F
 5. T
- C.**
1. Elements that determines the whether of a place are: temperature, rainfall, humidity, wind etc.
 2. Anaemometer tells about how fast is the wind blowing. Hygrometer is used to measure amount of water vapour in air i.e. humidity.
 3. Very tall trees together form a canopy.
 4. Penguins have thick skins and lots of body fat under their skin to keep warm in cold weather.
 5. Animals that spend most of their time in trees are called arboreal. The limbs feet and the tail of the monkeys are adapted to grasp branches. The red-eyed tree frog has sticky pads to climb on trees.

- D.** 1.

Weather	Climate
<ul style="list-style-type: none"> · Day to day condition of an atmosphere at a given time and place. · Short-term state of atmosphere. 	<ul style="list-style-type: none"> · Average weather condition of a given area taken over a long period of time. · Long term weather pattern.

2. The social behaviour of penguin is the best known of their adaptation. They huddle together in group of thousands as way of protecting themselves from cold in Antarctica.

3. Adaptation in the animals living in forests are:
 - (i) Camouflage- It helps them to merge with the background of the plants.
 - (ii) Clouded Leopard- It can catch its prey without being noticed.
 - (iii) Arboreal Habitat- The feet and limbs of monkey are adapted to grasp branches.
 - (iv) Startle warning colouration- Red- eyed tree frog opens its eyes suddenly to startle the predators. The heliconius butterfly has colouration that warn a predator that is unpalatable.
 - (v) Highly- developed sense organs- They have keen sense of hearing, smell and sharp eyesight either to protect themselves or to catch pray.
4. A penguin's body is especially adapted for swimming. For example, Penguins will engage the small muscles of their feather to create a tight waterproof layer. These feathers are coated with a special oil to keep the water out. This feather layer also reduces additional layers, so the penguin won't float in the water while swimming.
5. Skin of polar bear underneath the fur is black that helps it to stay warm by absorbing heat from the sun and white fur on its body helps it to camouflage and keeps it worm.

HOTS

1. Colour adaptations helps animals from predators and also in catching their prey. For example, goldenrod crab spider can change two colors-yellow and white. When it sits on yellow flower it turn yellow and when on white flower it turns white.
2. No, it cannot survive without trunk because it won't be able to eat or drink. It should have a long sticky tongue to gulp the food.

Life Skills

Do it yourself.

Chapter-8 Soil: A Natural Resource

Exercise

- | | | | |
|---|------------------|--------|--------|
| A. 1. (d)
5. (b) | 2. (b)
6. (b) | 3. (c) | 4. (d) |
| B. 1 F
5. F | 2. F | 3. F | 4. F |
| C. 1. (b)
5. (c) | 2. (a) | 3. (e) | 4. (d) |
| D. 1. Minerals present in soil are: quartz, calcite, granite etc.
2. The process from which rocks break down to form soil is called weathering.
3. Humus makes the soil fertile as it contains all the nutrients required by the plants for their proper growth.
4. E- horizon is the intersection layer between A- horizon and B-horizon. This layer contains sand and silt particles.
5. Depending on size, rock particles are divided in four groups clay, silt, sand and gravel. | | | |

6. Percolation rate for a given soil is time taken by water to pass through it. It can be calculated by following formula.

$$\text{Percolation rate} = \frac{\text{Amount of water collected (ml)}}{\text{Time taken (min)}}$$

7. Soil is said to be polluted when toxic chemicals are present in it in high enough concentration to pose a risk to human and/or the ecosystem.
8. Components of soil are: humus, living organisms and air.
- E. 1. Soil is formed from big rocks. Alternated heating and cooling due to heat of the sun caused the rocks to crack. These cracks get filled with water, which in winter froze due to cold. As water expands when frozen, ice breaks the rock into smaller pieces. Roots of trees, as they grow in size, also help to break the rocks. Action of wind and flowing water also helps in formation of soil. This is a slow and continuous process. It takes millions of years for formation of soil.
2. The components of soil are:
- (i) Humus: It makes the soil fertile as it contains all the nutrients required by the plants for their proper growth.
 - (ii) Living organisms: Many bacteria, insects and worms live in the soil.
 - (iii) Air: The gaps between the soil particles are filled with air. Soil organisms use air for respiration.

Activity: (I) Take different types of soil samples and a hand lens.

(ii) Observe them carefully using a hand lens.

You will see that soil contains organisms like insects, earthworm etc. These organisms breathe through air which is present in soil.

3.

Sandy soil	Clayey soil
<ul style="list-style-type: none"> • It contains more than 60% sand and less than 10% clay. • The size of particle is greater than 0.2 mm. • This soil can hold air. • This is used for construction of building. 	<ul style="list-style-type: none"> • It contains 60% clay. • The size of particle is around 0.002 mm. • This soil cannot hold air. • This is used for pottery and making bricks.

4. Diagram- Do it yourself.

Explanation- O-horizon: It mainly contains dead organic matter, which later decomposes to form humus.

A-horizon: It forms the top soil. This layer consists of humus and minerals and is dark in colour. It provides shelter to many decomposers such as microbes and worms.

E-horizon: This is the transition layer between the A-horizon and B-horizon. This layer contains sand and silt particles.

B-horizon: The B-horizon forms the subsoil. This subsoil is rich in minerals due to deposits of minerals released from percolating water.

C-horizon: This is the layer through which roots cannot penetrate because it consists of fragments broken down from the bed rock. Rainwater gets collected in this layer in the form of groundwater.

5. Gradual removal of the topsoil by the action of flowing water, wind waves is called soil erosion. Measures to prevent soil erosion are:
 Vegetation: This is the simplest and natural way to prevent soil erosion. Plants establish root system, which stabilises soil and prevents soil erosion.
 Mulch/Fertilizer: Applying a layer of mulch to the soil top allows the soil to slowly soak up water, as it protects against rain impact.
 Retaining walls- Retaining walls can be built around the area of erosion to prevent water run off. Run off water leads to further erosion.
6. Activity- Step-1- Take a clean, straight-sided jam jar and fill it about a third of the way up with the soil you are experimenting with. Also have ready another jar of cleaning water and stirring stick.
 Step-2- Add the clean water until the jar of the soil is almost filled.
 Step-3 - Now use the stirring stick to stir up the mixture thoroughly.
 Step-4 Leave the jar for one hour.
 The water has settled , you will be able to see different layers appearing.
7. Take some soil in the test tube and heat it high temperature. The water vapour in test tube rises up and reaches the colder temperature of the test tube and vapours condense due to touch of colder surface and the test tube is closed proving that soil contains water.
8. Characteristics of a good soil are:
 - It is rich in nutrients.
 - It contains organic matter that improves the structure of soil.
 - The soil pH should be in the range 6.0 to 6.8
 - It should contain variety of micro-organisms that support plant growth.

HOTS

Soil fertility can be improved in deserts by wind fences, brushes and other wind control structure. Pitting, imprinting and ripping treatments increase the surface roughness to capture the fine soil particles.

Life Skills

Do it yourself.

Chapter-9 Respiration in Living Organisms

Exercise

- | | | | |
|-----------------|------------------|----------------|--------|
| A. 1. (a) | 2. (d) | 3. (a) | 4. (a) |
| 5. (a) | | | |
| B. 1. F | 2. F | 3. F | 4. T |
| 5. T | | | |
| C. 1. breathing | 2. lungs | 3. bronchioles | |
| 4. breathing | 5. 12-20 breaths | | |
- D. 1. In oxidation, energy is released. Aerobic respiration is the process of oxidation of food with the help of oxygen present in the air to release energy.
 2. Main organs of respiratory system are: airway, lungs and muscles of respiration.
 3. Diaphragm protects the lung in the ribcage and provide them support.
 4. Frogs have moist and slimy skin which helps them to respire through skin underwater as well as on land.

5. Stomata is tiny openings/pores present on the underside of leaves. It helps in exchange of gases in green plants.

Diagram- Do it yourself.

- E. 1. During inhalation, the diaphragm contracts and moves down. The ribcage moves upwards and outwards. This causes the volume inside the chest cavity to increase and reduce the pressure inside it. When the pressure inside the lungs gets reduced. The air from outside rushes into the lungs. During exhalation. The diaphragm relaxes as it moves up and returns to normal shape. Ribcage also returns to its normal position. This reduces the volume in chest cavity. Reduction in volume inside the lungs increases the pressure inside it and is expelled out.
2. Inhaled oxygen enters the lungs through blood and reaches the alveoli. The amount of oxygen is more in the alveoli than the blood present in the surrounding capillaries. Therefore, the oxygen moves from the air to the blood by diffusion, the inhaled oxygen is absorbed by the red coloured pigment called haemoglobin, which in turn combines with oxygen to form oxyhaemoglobin. Oxygenated blood reach the heart through the blood vessels. The heart pumps this blood to the rest of the body.
Similarly carbon dioxide, the waste product of cellular respiration is eliminated from the body. It is absorbed by the blood capillaries surrounding alveoli. Since there is more carbon dioxide in the blood vessels than in the air, carbon dioxide diffuses from the blood the air into the alveoli and then it is exhaled.
3. Activity- Take two beakers with limewater and straw. Leave the first beaker with limewater undisturbed. Blow air into the second beaker with the help of straw. You will observe that in second beaker lime water turns milky which proves that carbon dioxide is present in air we inhale.
Diagram- Do it yourself.

4. a)

Aerobic	Anaerobic
<ul style="list-style-type: none"> • Releasing energy in the presence of oxygen. • Taken place in almost all organisms. • Chemical equation is as follows: Glucose + oxygen → carbon dioxide + Water + energy. 	<ul style="list-style-type: none"> • Releasing energy in the absence of oxygen. • Takes place in organisms like yeast and bacteria. • Chemical equation is as follows: Glucose → Alcohol + carbon dioxide + energy.

- b)

Respiration	Breathing
<ul style="list-style-type: none"> • It involves of gases exchange between the organisms and external environment. 	<ul style="list-style-type: none"> • This is the process of inhaling oxygen-rich air and exhaling carbon dioxide rich air.

- c)

Inhalation	Exhalation
<ul style="list-style-type: none"> · Inhalation means taking in. · We inhale oxygen, during respiration. · During inhalation, diaphragm contracts. 	<ul style="list-style-type: none"> · Exhalation means to give out. · We exhale carbon dioxide during respiration · During exhalation, diaphragm expands.

5. In insects, respiration takes place through trachea. During respiration air enters the body of these insects through spiracles and reaches all the cells of the body by passing through the network of trachea and tracheoles. Thus every cell gets oxygen directly. Carbon dioxide produced during respiration is released out of the body through the same network of trachea and tracheoles.

HOTS

1. Choking is caused when a piece of food gets stuck in the upper airway- When swallowing occurs, the trachea is covered by a flap called the epiglottis, which prevents food from entering the lungs.
2. If a potted plant is over watered, its root will not get enough oxygen to breathe as water fills up the airspaces present between the soil particles. This will cause decaying of the root and ultimately the plant dies.

Life Skills

Do it yourself.

Chapter- 10 Reproduction in Plants

Exercise

- A.** 1. (a) 2. (a) 3. (c) 4. (d)
5. (c)
- B.** 1. Clones of parent plant 2. layering 3. animals
4. Zygote 5. water
- C.** 1. Disadvantages of vegetative propagation are:
- By a vegetative propagation, plants lose their reproductive power after a few generations.
Due to loss of power to fight against diseases, they are prone to infections.
Plants become overcrowded at one place and face lack of nutrients due to competitions.
2. Some seeds are light and hairy because they have the adaptation of a seed which is dispersed by wind.
3. Micro propagation is the practice of rapidly multiplying stock plant material to produce many progeny plants, using modern plant tissue culture methods.
4. Advantages of seed dispersal are:
- Ensures that the plants are dispersed over wide areas.
 - Prevents competitions among the plants for space, sunlight water and mineral.

5. Reproduction is essential for continuity of life. It is the means of multiplication and perpetuation of the species.
- D.**
1. Advantages of vegetative propagation in plants are:
 - It does not need external agents like insects and wind for pollination and dispersal.
 - Food is usually stored in the vegetative parts of the plants.
 - This type of propagation involves only parent plant, no fertilisation is required.
 2. Grafting is a common method used in horticulture to develop new varieties of ornamental plants and fruit trees. In this method, a bud or cutting with buds of one plant called the scion, is kept over the cut stem of a rooted plant called the stock. The scion and stock are then firmly tied together.

Advantages of grafting:-

 - Plants mature earlier than those plants which are produced by seed.
 - This method can be used to produce disease free plants.
 - Plants can be propagated without variation.
 3. Diagram- Do it yourself.
 4. Features of insect pollinated flower are:
 - Flowers are brightly coloured, scented, and secrete nectar.
 - Pollen grains are larger, sticky and spiny.
 - Stigma of flower is small and deep within the corolla.
 5. Pollination is essential because it leads to the production of fruits we can eat, and seeds that will create more plants.

Agents of pollination are as follows:

 - Insects-example- sweet pea
 - Animals- example, sun birds
 - Wind- examples, flowers of wheat
 - Water- example, sea grass

HOTS

1. Potato shows nodes and internodes which is a characteristic of stem but nodes and internodes are absent in sweet potato.
2. Wind pollinated flowers have pollen grains that are light weight so they fly off in large numbers.

Life Skills

Do it yourself.

Chapter- 11 Motion and Time

Exercise

- A.** 1. (b) 2. (a) 3. (b)
- B.** 1. sundial 2. rest 3. speed
4. non uniform motion 5. graph
- C.** 1. (c) 2. (a) 3. (d) 4. (b)
5. (e)
- D.** 1. Graph work-do it yourself.
2. Water clock is better than sundial because it tells the time at night as well as during the day. The rate of flow of water is very difficult to control accurately.

3.

Periodic motion	Non-periodic motion
<ul style="list-style-type: none"> • A motion which repeats itself at regular interval of time is called a periodic motion. • For example- motion of earth around the sun. 	<ul style="list-style-type: none"> • A motion which cannot repeat itself at regular interval of time is called non-periodic motion. • for example- vehicles in a traffic.

4. Distance covered by a body in unit time is called speed. Its S.I unit is m/s.
- E.** 1. S.I system of units is a scientific method of expressing the magnitudes or quantities of natural phenomenon.
- For example- metre is the S.I unit of distance. Second is S.I unit of time.

2. Speed= Distance/Time

$$\begin{aligned} \text{Speed} &= \frac{270}{4} \\ &= 67.5 \text{ km/h} \end{aligned}$$

3. a) Speed= Distances/ Time

$$= \frac{200}{10} = 20 \text{ m/s}$$

b) $20 \times \frac{18}{5} \text{ km/h}$

$$72 \text{ km/h}$$

4. Speed= Distance/Time

Distance= Speed X time

$$\begin{aligned} &= 950 \times 7 \\ &= 6650 \text{ km} \end{aligned}$$

5.

Uniform Motion	Non-uniform motion
<ul style="list-style-type: none"> • If a body travels equal distance in equal intervals of time, it is called uniform motion. • For example- movements of the hands of a watch. 	<ul style="list-style-type: none"> • If a body travels unequal distance in equal interval of time, the body is said to be in non-uniform motion. • For example- A person jogging in the park.

HOTS

1. Our heart beats 72 times in a minute. So, heart beat rate is periodic and can be used to measure time.
2. 30 oscillations are required to make the second hand to complete one minute.
3. The boards tries to tell us that, the speed of our vehicle should be slow.

Life Skills

Do it yourself.

Chapter- 12 Electric Current and its Effects

Exercise

- A.**
- | | | | |
|--------|--------|--------|--------|
| 1. (a) | 2. (c) | 3. (d) | 4. (b) |
| 5. (a) | 6. (a) | | |
- B.**
- | | |
|-----------------------|--------------|
| 1. Positive, negative | 2. battery |
| 3. tungsten | 4. nichrome |
| 5. copper | 6. temporary |
- C.**
- | | | | |
|------|------|------|------|
| 1. F | 2. T | 3. F | 4. F |
| 5. F | | | |
- D.**
1. In an open circuit there is a gap between connecting wires due to which, one terminal of the cell gets disconnected and hence the current stops flowing.
 2. When switch is in on position, the circuit is complete and current flows through it. When switch is in off position, the circuit gets broken and no current flows in it.
 3. If the plastic insulation of live wire and natural wire gets torn due to wear and tear, then the two naked wires touch each other. The touching of live wire and natural wire directly is known as short circuit.
 4. Diagram- Do it yourself.
 5. Applications of electromagnets are:
 - Electromagnets are used in construction of large number of devices like electric bells, loudspeakers, toys etc.
 - These are also used to lift heavy loads like big machines, steel girders and scrap iron object for loading and unloading purposes.
 6. We should choose a wire which melts easily to prevent damage.
 7. a) Electric fuse: An electric fuse is a safety device which prevents electric fire and damage to electrical appliances due to excessive flow of current.
b) Electromagnet- The magnet made by using electric current is called on electromagnet.
- E.**
1. Activity: Make three circuits to glow a blub, one with single cells the second with two cells and the third with three cells. Switch each circuit on for two minutes and then switch off. When we will touch and feel the glass body of the bulb each circuit, we will feel difference.
The bulb in the third one is the hottest which shows that more is the current, larger is the heating effect.
 2. A fuse is a safety device which prevents electric fire and damage to electrical appliances due to excessive flow of current. A fuse works on heating of electric current.

Working- A fuse consist of a short length of a thin, tin plated copper wire having low melting point. Thin fuse wire has a much greater resistance than the rest of the electric wiring in the house. When the current in a household circuit suddenly increase too much, their fuse wire gets heated, it melt and breaks the circuit due to which current stops flowing.

Significance- It prevents damage to various electrical appliances.

3. Structure of electric bell: It has a coil of wire wound on iron piece a thin metal strip with a hammer at its end a gong and a contact screw.

Working: When the iron strip is in contact with the screw, the circuit is complete and the current flows through the coil of wire making it on electromagnet.

This electromagnet will attract the thin metal strip and the hammer, as a result the hammer hits the gong producing a sound.

When the metal strip is attracted towards the electromagnet, it contacts with the screw and breaks and so the circuit breaks.

No current flows and the coil becomes an ordinary coil. The iron strip comes back to its original position and touches the screw.

- The circuit is complete again and hammer hits the gong producing sound.
- This process gets repeated very quickly and the bell rings.

Everytime current flows through the circuit the coil becomes an electromagnet and the hammer hits the gong. This is how an electric bell works.

4. MCB's are used instead of fuses because MCB does not work on the heating effect of electric current. It works on magnetic effect of electric current. It automatically turns off when the current in the circuit become too large. Unlike a fuse which can be used only once and has to be replaced. MCB can reset manually to restore electricity.

HOTS

1. Cells can give only a small amount of electric current whereas batteries can give a large amount of electric current. Batteries are used in those devices which require high power such as inverter.
2. A fuse is used as circuit breaker i.e. whenever there is a short circuit, (huge amount of current flows) the main function of the fuse wire is to melt down and break the circuit so that appliances do not get damaged. If we use wire of high melting point then during short circuit it wouldn't melt down easily and would cause the damage to the appliances and may result in fire.

Life Skills

Do it yourself.

Chapter- 13 Wind

Exercise

- A. 1. (d) 2. (a) 3. (b) 4. (b)
5. (c) 6. (d)
- B. 1. difference 2. expands 3. temperature, low
4. Monsoon winds 5. eye 6. twister

- C. 1. F 2. F 3. F 4. T
 5. F 6. T 7. T
- D. 1. Hot air rises up because air expands on heating, hence it becomes less dense than the air around it. Less dense air floats on more dense cold air.
2. Winds that brings small amount of rain in winter all called monsoon winds.
3. Factor an which air pressure depends are:
 (i) temperature
 (ii) altitude
4. a) Natural calamity- A terrible event that causes a lot of damage or harm.
 b) Air pressure- Pressure exerted by air.
 c) Lightning- The occurrence of very quick electrical discharge that occurs between a cloud and the ground, between two clouds, or within a cloud.
 d) Cyclone- A cyclone is a huge revolving storm caused by violent winds blowing around a central area with low atmospheric pressure.
 e) Tornado- It is a small funnel of wind that hangs down from a thundercloud and twists around at a very high speeds.
5. During thunderstorm, sparks jump from cloud to cloud and some of them even strike the ground which is called lightning. Lightning heats the surrounding air so quickly that it makes the loud booming noise of thunder. Hence , thunder and lightning occurs together in the cloud.
6. The region close to equator gets heated up the most. The air here becomes warm and rises, producing low pressure region. Cooler air from either side of the equator rushes in to take place. Thus at the equator, wind blows from the north and the south towards the equator.
- E. 1. When rubber sucker is pressed on a smooth surface it sticks to the surface because there is very little air between the sucker and the smooth surface to push from inside. Therefore, the greater atmospheric pressure from outside pushes the sucker firmly to the surface.
2. In hot regions, the air gets warmer and rises up. This produces region of low pressure. Cool air from surrounding rushes into take its place. This causes winds to blow.
3. The region close to the equator gets heated up the most. The air here becomes warm and rises, producing a low pressure region. Cooler air from either side of the equator rushes into take its place. Thus at the equator, winds blow from the north south towards the equator. As the air goes north, it meets cold dense air from the poles at latitude of about 60° Being warmer than polar air it rises. Thus low pressure area is created at 60° latitude. The cold, dense air from the polar region rushes into take its place. In this way, a pattern of wind circulation is set up on the earth.
4. A cyclone is a huge revolving storm caused by violent wind blowing around a central area with low atmospheric pressure. The centre of the storm is a calm,

cloudless area called the eye. There is no rain here and the winds are fairly light. Cyclones develop over the sea, but they move to the land. Cyclone may cover hundreds of kilometers and its wind may blow at the rate of 200 km per hour.

5. Articles to pack when there is a cyclone are:
 - Torch
 - Spare batteries
 - candles
 - First Aid kit
 - Matches
 - Non-perishable food
 - Bottled water
 - Utility knife
6. During and After the cyclones
 - Check for gas leakage. Do not use electric appliances if wet.
 - Beware of fallen power lines, loose wires hanging from poles.
 - It is not safe to enter the flood water.

HOTS

Yes, wind energy is a transformed form of sun's energy because wind blows when warm air rises up and cool air takes its place. And air becomes warm due to sunlight.

Life Skills

Do it yourself.

Chapter- 14 Light and Associated Phenomena

Exercise

- A.** 1. (a) 2. (d) 3. (d) 4. (c)
5. (a)
- B.** 1. laterally 2. convex 3. virtual, magnified
4. converging 5. convex
- C.** 1. T 2. F 3. T 4. F
5. F 6. F
- D.** 1. (b) 2. (c) 3. (d) 4. (e)
5. (a)
- E.** 1. When light falls on an object, it changes its direction, and bounces back. This bouncing back of light is known as reflection of light.
2. Angle of reflection is always equal to angle of incidence. So if a ray of light falls on plane mirror at an angle of 60° then angle of incidence is also 60° .
3. Image formed by plane mirror is:
 - It is always virtual.
 - It is of the same size as of the object.

- Image formed in a plane mirror is erect.
4. Uses of spherical mirror:
 - Concave mirror is used as shaving mirror.
 - Dentists also use concave mirror.
 - Convex mirror is used in large shops to keep an eye on customers.
 5. Lateral inversion is a phenomenon in which left appears to be right and vice versa.
 6. White light splits into seven colours when it passes through a prism which is called spectrum of light.
 7. This happens because the effect of the image of the colour does not disappear immediately from the eye, but persists for a fraction of a second. When the disc rotates, the colours form an image one after the other and we see a combined effect of all the colours which is a white colour.
- F. 1. Terms used in reflection are:

Incident ray: The ray of light which falls on the surface of the reflecting material or mirror is the incident ray.

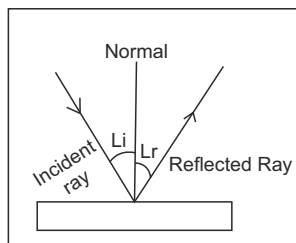
Reflected ray: The ray of light which is sent back from the surface of the reflecting surface is the reflected ray.

Point of Incidence: The point at which the light ray strikes the reflecting surface is the point of incidence.

Normal: The perpendicular line drawn from the point of incidence on the reflecting surface is the normal.

Angle of Incidence: The angle between the incident ray and the normal is the angle of incidence.

Angle of reflection- The angle between the reflected ray and the normal is the angle of reflection.



2. **Activity-** Take three cardboard sheets, make small holes at the centre of these cardboards. Fix the cardboard sheet on the three stands and place it in front of the hole made on the first cardboard sheet. See the candle flame through the hole of the third cardboard sheet. Now, move the third stand a little away from the line. We will observe that the candle flame is visible when the hole of the cardboard sheets are in a straight line. The flame is not visible when the cardboard sheet is moved away. This shows that light travels in a straight line.
3. **Diagram-** Do it yourself.
4. In case of a convex lens- parallel rays passing through it, converge to a point known as the principal focus.
In case of a concave lens the rays of light do not actually meet, but appear to diverge from a point called the principal focus.
5. A Newton's disc is made by painting a disc with seven colours. The disc is then rotated fast, and we see that the colours of the disc seem to disappear and the

disc appears white. This happens because the effect of the image of the colour does not disappear immediately from the eye, but persists for a fraction of a second. When the disc rotates. The colours forms images one after the other and we see a combined effect of all the colours which is a white colour .

HOTS

Lenses used to see nearby object are concave in shape. Lense used to see far off objects is convex lens.

Life Skills

Do it yourself.

Chapter- 15 Water

Exercise

- A.** 1. (d) 2. (b) 3. (a) 4. (b)
5. (b) 6. (d)
- B.** 1. 70 2. salty 3. surface 4. 0°C
5. infiltration 6. water cycle
- C.** 1. (c) 2. (d) 3. (a) 4. (b)
- D.** 1. (I) Evaporation due to sun in rivers, lakes and oceans.
(ii) Plants release water vapour through stomata.
2. Rainwater replenishes the groundwater by seepage through the soil .
The problem arises when we pump out excess water from the ground than the rate at which it is recharge by the rain. Then the water table goes down, and it is said to have been depleted.
3. Two causes of water scarcity are:
(I) Population Expansion: Demand of water has increased due to growth of population. Various uses of water and increase in the standard of living further increase the demand for water year after year.
(ii) Pollution- Water, air and land pollution together contribute to the reduction of water quality.
4. Water in the seas and oceans contains salt hence it cannot be used for domestic and industrial use.
5. Two ways to minimise waste water are:
(I) Recycle the water at home.
(ii) Industrial waste and sewage should be treated before it is discharged in the water sources.
- E.** 1. Natural resources can be classified as renewable or non-renewable depending on whether or not they replenish naturally. Renewable resources are: Sunlight water air and wind
Non-renewable resources are: Minerals fossil fuels.
2. Uses of water-
(I) It is used in agriculture.
(ii) It is used in manufacturing of medicines and chemicals.
(iii) It is used for entinguishing fire.
(iv) It is used as a means of transport.
(v) It is stored in dams for producing electricity.

3. Reasons for the depletion of water table are:
- (i) Population Expansion: As the population increase demand of water increases.
 - Pollution: Sewage, oil discharges from industries, waste dumping in water bodies etc end up polluting water.
 - Urbanisation: Cities tend to hold more people than towns and village. This means there is an increased need to take care of sewage.
 - Deforestation: Root of the trees have ability to bind soil, thus enable to hold water and so deforestation leads depletion of water bodies.
 - Global Warming: The increase in global temperature causes change in the seasons, which can lead to a decrease in the rain that falls on the earth, thereby causing water scarcity.
4. Rainwater and water from other sources seep down through soil. It keeps on flowing through various layers of the soil till it reaches the hard rock underneath. This water goes on accumulating on top of non-porous hard rocks under the ground in the form of water reservoir which is called underground water. Groundwater supplies are replenished by rain or melting of snow that seeps down into the crack zone surface. Groundwater is very useful for farmers as they use an unsustainable amount of well water to irrigate their crops.

5.

Surface Water	Ground Water
<ul style="list-style-type: none"> • Water which flows over the earth's surface is called surface water. • Source of surface water are- river, ponds, lakes, oceans etc. 	<ul style="list-style-type: none"> • Water which is deep in the ground is called groundwater. • Source of ground water are: Wells.

HOTS

1. Farmers are increasing their use of groundwater to grow staple crops such as rice, wheat and cotton. Therefore the well dried up.
2. Human activity is major cause of water scarcity due to use of fossil fuels that alter climate and weather activity. Scarcity of water also occurs due to deforestation which is an activity done by us.

Life Skills

Do it yourself.

Chapter- 16 The Green Life line

Exercise

- A.**
1. (a)
 2. (a)
 3. (b)
 4. (d)
 5. (b)
- B.**
1. important
 2. humus
 3. Plants
 4. Deforestation, pollution
 5. Plants
- C.**
1. T
 2. F
 3. T
 4. F
 5. T

- D. 1. a) canopy- The uppermost tree branches of tall trees.
 b) Humus- The leaves, flowers, fruits etc are converted into humus by decomposers. It increases the fertility of the soil.
 c) Decomposers- The microorganisms that convert dead matter of plants and animals into simple substances.
 d) Soil erosions- Displacement of upper layer of the soil.
2. a) Habitat is a natural home or environment of an animal plant or other organisms whereas biodiversity is variety of plant and animal in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.

b)

Deforestation	Decertification
<ul style="list-style-type: none"> • It is removal, decrease or deterioration of forest cover of an area. • Rainfall decreases to only minor extent. • Moderation of temperatures is reduced. 	<ul style="list-style-type: none"> • It is conversion of forms, moist and fertile land into oxid desert area. • Rainfall is less than the potential evaporation. • Temperature is either high or low.

3. a) Forest purify air and provide clean and fresh air for breathing to all living beings.
 b) Forests help in reducing pollution.
4. Forest provide us food, wood, rubbers, gum, honey etc.
5. To protect the forest we can avoid cutting of trees and if we cut for our use, we should plant more trees.
- E. 1. Food used is natural interconnection of food chains. For example grasshopper eats grass, frog eats the grasshopper, snake eats the frog and eagle eats the snake.
2. Uses of forests are as follows:
- (i) Forest purify air and provides clean and fresh air for breathing to all human beings.
 - (ii) Forest regulate climate by reducing temperature and help in rainfall.
 - (iii) Forest help in reducing pollution.
 - (iv) Forest provide animals shelter to live.
 - (v) Forest provide us food, wood, gum, resin etc.
3. Effects of deforestation are:
- (i) With no plants and trees to hold the soil together, the soil gets washed away by strong winds and flowing water.
 - (ii) Things like wood, medicine and various other products, which we obtain from forests would no larger be available if deforestation carries on indiscriminately.
 - (iii) The most important consequence of deforestation is the change in climate. Without a forest cover, the amount of carbon dioxide will

increase in the atmosphere. Being a greenhouse gas, it will aid in global warming, increasing in the temperature on the earth.

4. Same ways to conserve forests are:
 - (i) Overgrazing by cattle and other animals should be stopped.
 - (ii) Large- Scale cutting of the forests must be stopped.
 - (iii) To develop new forests, more saplings should be planted every year during the rainy season.
 - (iv) Forest fires must be checked. People should avoid smoking or cooling in the forest area.
 - (v) Forests must be protected from insects, pests and infection by treating them with insecticides and pesticides.
5. A nutrient cycle is the movement and exchange of organic and inorganic matter back into the production of matter. The process is regulated by food web pathways. Which decompose organic matter into inorganic nutrients. Nutrient cycle occurs within ecosystem.
6. Two important benefits of forests are:
 - (i) Forests purify air and provide clean and fresh air for breathing.
 - (ii) Forests helps in reducing pollution.
7. Plants and animals depend on each other. The relationship is mainly for food, oxygen, energy, shelter and protection. For example- Animals obtain oxygen from plants and plants depend on animal for carbon dioxide. Plants during photosynthesis release oxygen which is utilized by animals and animals during respiration release carbon dioxide which is utilized by plants for making food. Animals get shade and protection from sun and rain due to plants and plants depend on animals for pollution and seed dispersal.

HOTS

Human beings eat meat which is usually beef, chicken, turkey or pork. These animals are herbivorous. So the food chain for meat is only three organisms: plants-producer, herbivore and human consumer.

Life Skills

Do it yourself.

Chapter- 17 Management of Waste Water

Exercise

- | | | | | |
|-----------|---|--------|--------|--------|
| A. | 1. (d) | 2. (c) | 3. (c) | 4. (b) |
| | 5. (c) | | | |
| B. | 1. (c) | 2. (a) | 3. (e) | 4. (b) |
| | 5. (d) | | | |
| C. | 1. F | 2. F | 3. T | 4. F |
| | 5. T | | | |
| D. | 1. Four diseases that can be caused by an improper drainage system are: jaundice, malaria, cholera and typhoid. | | | |
| | 2. Oil/Ghee should be soaked in waste cotton cloth and then should be disposed off as a solid waste. | | | |

3. Types of on-site sewage disposal system are: Septic tank, vermi-compositing, landfill and incineration.
 4. Pure water is odourless, odorless and transparent.
 5. Pollutants present in sewage are wastage from homes, industries, hospitals such as cans, plastic bags, napkins, sand pebbles etc.
- E.**
1. Sewage is liquid water containing wastewater from homes hospitals rundown rain water and many dissolved and suspended substances. It is harmful to discharge untreated sewerage into rivers and lakes because it might pollute rivers and lake and polluted water can act as a cassia harmful pathogenic organisms that spread diseases.
 2. Step 1: The wastewater is passed through bar screens. Large objects such as rags, cans, plastic, bags are removed.
 - Step 2: Then the water is sent to the grit and sand removal tank. Here sand, grit and pebbles settle down and water is sent to sedimentation tank.
 - Step 3: The water from step 2, is allowed to settle down in a large circular tank. Solid such as faeces settle down at its bottom and are removed with a scraper. This is called sludge. Lighter oily solids are removed with a skimmer. The water so obtained is clarified water.
 - Step 4: The clarified water is aerated bacteria to grow. Aerobic bacteria decompose biodegradable contaminant in few hours.
 - Steps 5: Upper layer of clean water is then either discharged into a water body such as sea, river or into the ground or disinfected with chlorine or ozone and released into the distribution system.
 4. Oil/ghee should not be disposed off in an open drain because it clogs the pores in the soil. This reduces the water absorbing capacity of the soil, and therefore the seepage of water in the ground is reduced.
 5. Animal and human excreta are health hazards. They pollute the soil and water. When it rains, such excreta gets washed down to rivers, ponds and pollutes the water. When polluted water seeps into the ground, it contaminates groundwater and this polluted groundwater becomes source of water borne diseases such as typhoid, jaundice, cholera, polio etc.
 6. Septic tank is a type of waste disposal. A septic tank is simply big concrete or steel tank. Wastewater flows into the tank at one end and treated water leaves the other.

HOTS

Chlorine is added to swimming pool to disinfect the pool water and make it free from disease causing germs. That is why chlorine is called swimming pool chemical.

Life Skills

Do it yourself.

Model Test Paper-1

- | | | | | |
|-----------|-----------------|----------------|------------------|--------|
| A. | 1. (b) | 2. (a) | 3. (d) | 4. (d) |
| B. | 1. food factory | 2. Acetic acid | 3. new substance | |
| | 4. breathing | | | |

- C. 1. False 2. False 3. False 4. False
- D. 1. Bile juice breakdown carbohydrate into simple sugar.
 2. Celsius scale and fahrenheit scale.
 3. Condition necessary for rusting are damp air and water.
 4. Minerals present in rocks are quartz, calcite and pyroxene
 5. Diaphragm moves up when we inhale, increasing the area of chest cavity so that air can enter our lungs.
- E. 1. Insectivorous plant trap, kill and digest insects. They can usually make their own food but take some of the nutrition from insects. For example: In venus flytrap, insects are lured by the nectar into the jaw like leaf trap. Once the insects sits on the leaf, the jaws' clamp shut and the insect is trapped in it. The plant immediately secretes digestive juices that first drown and then dissolve the insect.
 2. Sheeps involved in processing of wool are:
 (i) Shearing- Process of removing fleece using special clippers.
 (ii) Scouring- Removing duet, dirt, oil grease etc. from sheared fleece.
 (iii) Sorting- Segregating the long fine quality fleece from less fine quality which are broken into smaller pieces.
 (iv) Combing- Hair are sent into a carding machine, and combed into a sheet.
 3. Litmus is extracted from lichens therefore it is a natural indicator. Blue litmus paper turns red in presence of acid and red litmus paper turns blue in presence of blue.
 4. Social behaviour of penguins is the best known of their adaptation. They huddle together in group of thousands as way of protecting themselves in Antarctica.
 5. During inhalation, the diaphragm contracts and moves down. The ribcage moves upwards and outwards. This causes the volume inside the chest cavity to increase and reduce the pressure inside it. When the pressure inside the lungs get reduced. The air from outside rushes into the lungs. During exhalation, the diaphragm relaxes as it moves up and returns to its normal position. This reduces the volume within the chest cavity. The reduction in volume inside it. Thus, air is expelled out.

Model Test Paper-2

- A. 1. (a) 2. (b) 3. (a) 4. (b)
- B. 1. insects 2. expands 3. converging
 4. infiltration
- C. 1. T 2. F 3. F 4. F
- D. 1. (c) 2. (d) 3. (a) 4. (b)
- E. 1. A switch is a simple device that is used to break the electric circuit or to complete it.
 2. Image formed by plane mirror is always virtual, of the same size of the object, and erect.

3. Rainwater replenishes the groundwater by seepage through the soil. The problem arises when we pump out excess water from the ground, than the rate at which it is recharged by the rain. then the water level goes down and it is said to be depleted.
 4. Oil/Ghee should be soaked in waste cotton cloth and then should be disposed off as a solid waste.
- F.**
1. The region close to the equator gets heated up the most, the air here becomes warm and rises, producing a low pressure region. Cooler air from either side of the equator rushes in to take place. At the equator, winds blow from the north south towards the equator. As the air goes north, it meets cold dense air from the poles at latitude of about 60° . Being warmer than polar air it rises. Thus low pressure area is created at 60° latitude. The cold dense air from the polar region rushes in to takes its poles. In this way pattern of wind is upon the earth.
 2. Natural resources are classified renewable or non-renewable resource. Examples of renewable resources are: Sunlight, air, water etc. Example of non-renewable resources are: fossil fuels, minerals.
 3. Effects of deforestation are:
 - a) With no plants and trees to hold the soil together, the soil gets washed away by strong winds and flowing water.
 - b) Animals will loose their natural habitat and they might even die. This will eventually lead to extinction of different species.
 - c) Things like wood, medicine and various other products, which we obtain from forests would no longer be available.
 4. **Steps involved in getting clarified water from wastewater are:**
 - Step 1: The wastewater is passed through bar screens. Here, large objects such as rags, cans, plastics etc are removed.
 - Step 2: The water after step 1 is sent to the grit and sand removal tank. Here sand, grit and pebbles settle down and the water is sent sedimentation tank.
 - Step 3: The water from step 2 is allowed to settle down in a large circular tank. Solid such as faeces settle down in a large circular tank. Solid such as faeces settle down at its bottom and are removed with a scrapes. This is called sludge. Lighter oily seeds are removed with a skimmer. The water is clarified water.
 - Step 4: The clarified water is aerated to help aerobic bacteria to grow. Aerobic bacteria decompose biodegradable contaminants such as human waste food waste etc. in a few hours.
 - Step 5: The upper layer of clean water is then either discharged into a water body such as sea, river or into the ground or disinfected with chlorine or ozone and released into the distribution system.