Teacher Manual

Amazing Science-4

1. Food Making in Plants

EXERCISES

A. Choose the correct option:

1. (a) Cactus 2. (d) Mushroom
3. (b) Soil 4. (c) Potato
5. (c) Lamina

B. Write 'True' or 'False':

1. [True] 2. [True] 3. [True]
4. [False] 5. [True]

C. Name the following:

1. Chlorophyll 2. Midrib
3. Oxygen 4. Stomata
5. Sun

D. Give Reasons:

1. Reason: Photosynthesis in cacti takes place in stems because cacti have no leaves. They have fleshy green stems having chlorophyll in them. Photosynthesis takes place in their stems.
2. Reason: Mushrooms and mould cannot make food on their own because they do not have chlorophyll. They cannot make their food. They grow on dead and decaying plants and animals. They get their food from them.
3. Reason: We should not sleep under trees at night because they release carbon dioxide.
4. Reason: A balance between plants and animals is very important in nature. If there is a sudden increase or decrease in the number of plants or animals, this would disturb the balance in nature.

   If there is a sudden increase in animals, plants would not be able to supply enough food and oxygen to all of them.

   If there is a sudden decrease in plants, animals would not be able to supply enough carbon dioxide to all the plants.

   Therefore, a balance between plants and animals is very important in nature.

E. Answer the following questions:

1. Leaves look green because of chlorophyll.
2. The main parts of a leaf are as follows:
   1. Lamina :Flat and broad part is called Leaf Blade or Lamina.
   2. Mid-Rib: A thick line that runs across middle of leaf. It is main vein to carry food.
   3. Petiole: Small stalk that attaches leaf to a branch.
   4. Veins : Many other lines (veins) that emerge from mid-Rib. Veins bring water and minerals to leaf from roots and carry food to different parts of leaf.
   5. Margin : Edge of leaf.
   6. Apex: Tip of leaf
   7. Pores: Underside of leaf has tiny pores.
   8. Guard Cells: Pores are guarded by cells called Guard Cells. They control opening/closing of Stomata.
   9. Stomata : It causes exchange of Carbon Dioxide and Oxygen takes.
3. 'Photo' means light and 'Synthesis' means putting together. Photosynthesis is a process in which green plants make food in the presence of air, water and sunlight. Plant takes in water and minerals from soil by roots. Chlorophyll in leaves traps light energy from Sun. In the presence of Carbon Dioxide and Air, food-making process starts. Oxygen is released as by-product and food is stored in the form of Starch.

Following things are essential for photosynthesis:

1. Sunlight 2. Water
3. Carbon dioxide 4. Chlorophyll

4. Plants use their food in the following ways:
   1. Food is used for the growth of stems, new leaves, flowers and fruits.
   2. Food is used to make new cells at the site of injury of plant. If a branch or a leaf is broken or plucked, plant repairs itself with the new cells.
   3. The extra food is stored in leaves, stems and roots. We eat that part of plant which has food stored in it.
5. A food chain shows how energy is passed from one living being to another. For example: A deer eats plants to get energy. The deer itself is eaten and becomes food of a lion. The lion gets energy from deer. Thus, energy and nutrients of plant first pass to deer

and then to the lion. Second example: Grass is eaten by a grasshopper. The grasshopper is eaten by a frog. The frog is eaten by a snake. Snake is eaten by a hawk.

6. The level of carbon dioxide and oxygen is maintained in nature as follows:
   - Animal and human being need food to eat and oxygen to breathe. They get these from plants.
   - Animals and plants depend on each other for many things.
   - Plants need carbon dioxide to make food. They get this gas when animals and human beings breathe out carbon dioxide.

HOTS Questions

1. Growth becomes slow in most plants during writer because of less supply of sunlight.
2. Mushrooms are sometimes not considered as plants because they cannot make food on their own. They do not have chlorophyll in them. They grow on dead and decaying plants and animals. They get their food from them.

Activity Time

Do it yourself.

2. Adaptation in Plants

EXERCISES

A. Choose the correct option:

1. (a) Pine 2. (d) Water Hyacinth
3. (b) Yeast 4. (d) Sundew
5. (c) Bamboo

B. Tick (✓) the correct words given in the brackets:

1. Plants in hot and wet areas are called evergreen.
2. Mangroves grow in the soil that is rich in air.
3. Underwater plants have narrow leaves.
4. Algae are green plants.
5. Wheat, paddy, maize and barley are grasses .

C. Write 'True' or 'False':

1. [True] 2. [True] 3. [False]
4. [False] 5. [True]

D. Write two examples of each of the following:

1. (i) Cactus (ii) Babool
2. (i) Wolfia (ii) Hyacinth
3. (i) Lotus (ii) Water Lily
4. (i) Hydrilla (ii) Tape Grass
5. (i) Wheat (ii) Rice

E. Answer the following questions:

1. Habitat is a place or area where a plant grows. Different plants grow in different kinds of habitats.
2. Difference between terrestrial plants and aquatic plants is as follows:

   Terrestrial Plants: Plants that grow on land are called terrestrial plants. They too differ depending on type of climate and soil where they grow. Terrestrial Plants grow in different areas as follows:

   Plains: Trees are called deciduous trees. They adapt to hot weather of plains. They have many leaves. They shed leaves in winters. Examples: Sheesham, Sal, Gulmohar, Pipal, Banyan.

   Mountains: Trees are tall and straight. They are cone-shaped to slide off snow from branches. They bear cones instead of flowers. They are called coniferous or conifers. Leaves are modified into spines to survive cold weather. They have a thick, woody and straight stem. Examples: Pine, Spruce, Fir, Deodar, Cedar.

   Wild: Plants that do not need care to grow are called wild plants. They grow naturally for many years. They can be seen growing in forests. Example: Banyan Tree.

   Deserts: Deserts have very little rainfall. Plants have green, thick, fleshy stem to conduct photosynthesis and store water. Plants have spines instead of leaves to prevent loss of water. Roots spread wide and deep in search of water. Examples: Cactus, brittlebush, Date Palms, Palm.

   Marsh: Marshy areas are wet, humid with clayey soil and plenty of water. Mangroves are found in these places. Plants have roots that grow out of soil and water to get enough air to breathe. Roots absorb water and other nutrients for photosynthesis. Examples: Kendelia, Cariops.

   Aquatic Plants: Plants that live in water are called aquatic plants. They are of three kinds as follows:

   Floating: Floating plants are light and spongy to float on water. They have air filled in them with a lot of empty spaces in entire body. Roots are not fixed to water-bed. Examples: Duckweed and Water Hyacinth.

   Fixed: Fixed aquatic plants have roots fixed to water-bed. They are light and have hollow stems. Leaves are broad and waxy

coated to prevent them from rotting. Leaves have stomata on upper side of leaf to enable exchange of gases. Examples: Lotus and Water Lily.

Submerged: Plants grow under water surface. Roots are fixed to water-bed. They have narrow, ribbon-like leaves offer least resistance to water currents. Stems are flexible and have air spaces. Examples: Tape Grass, Pondweed and Hydrilla.

3. Deserts have very little rainfall. Plants have green, thick, fleshy stem to conduct photosynthesis and store water. Plants have spines instead of leaves to prevent loss of water. Some plants have very small leaves with a waxy coating. Roots spread wide and deep in search of water. Examples: Cactus, brittlebush, Date Palms, Palm.
4. The main difference between algae and fungi is as follows:

   Algae: Algae is a small plant. It is found in water and damp places as green patches. Algae are green. It contains chlorophyll. They make food on their own with the process of photosynthesis.

   Fungi: Fungi have no real stems or roots. They have no chlorophyll. They cannot make their own food. They grow on dead and decaying matter. Examples: Mushrooms and Yeasts. Mushrooms are very rich in proteins. Yeasts are used to make bread and cakes.
5. Plants of grass family are very useful to us. Wheat, Maize, Barley and Oats are grasses. They are called cereals. Their seeds are called grains. Cereals are most important group of plant kingdom. If we don't have these grains, we would not have bread, cakes, rice or popcorn. Grasses also provide food for cattle that give us milk. Bamboo is biggest plant o grass family. It is used to make huts, baskets and brooms. It is also used to make paper.
6. Insectivorous plants eat insects. They are also called Carnivorous Plants or Meat-Eaters. Insectivorous plants grow in places where soil is deficient in Nitrogen. Plants catch insects and turn them into liquids. Some insectivorous plants are:

   • Pitcher Plant: The leaf is modified into a pitcher. The pitcher has some liquid in it. Insects are attracted to pitcher due to its bright colour and a sweet juice called nectar. When insects sit on the rim of leaf, they fall down in pitcher and get digested.

   • Venus Fly-trap: It has unique leaves that shut down like a pair of jaws. Leaves have sharp teeth-like structures. When an insect lands on leaf, the teeth shut down, trapping the insect. Juices come out of leaf that slowly digest the insects.

   • Sundew: It has many deadly tentacles on its leaves. When an insect sits on leaf, the tentacles trap it.

D. Give Reasons:

1. Reason: Plants on mountains and hills have conical shape because they slide off snow from their branches. They bear cones instead of flowers. They are called coniferous trees or conifers. Leaves are modified into spines to survive cold weather conditions. They have a thick, woody and straight stem. Examples: Pine, Spruce, Fir, Deodar, Cedar.
2. Reason: Plants in the plains have lots of leaves because they are adapted to hot weather of plains. Trees have many leaves. Trees found in plains are called deciduous trees. Trees shed their leaves in winters. Examples: Sheesham, Sal, Gulmohar, Pipal, Banyan.
3. Reason: Mangrove have breathing roots that grow out of soil and water to get enough air to breathe. Roots absorb water and other nutrients essential for photosynthesis. Marshy areas are wet, humid with clayey soil and plenty of water. Mangroves are found in these places. Examples: Kendelia, Cariops.
4. Reason: Floating Plants are light and have spongy stem in order to float on water. They have air filled in them with a lot of empty spaces in entire body. Roots are not fixed to water-bed. Examples: Duckweed and Water Hyacinth.
5. Reason: Algae is a small plant. It is found in water and damp places as green patches. Algae are green. It contains chlorophyll. They make food on their own with the process of photosynthesis.

HOTS Questions

1. We would find this plant in Desert Region.
2. The name of plant is Lotus.

Activity Time

A. Duckweed B. Do it yourself.

3. Reproduction in Animals

EXERCISES

A. Choose the correct option:

1. (a) Embryo 2. (b) spawns
3. (b) fry 4. (d) birds
5. (c) Nymph

B. Write 'True' or 'False':

1. [True] 2. [True] 3. [True]
4. [False] 5. [False] 6. [True]

C. Write 'E' for egg-laying animals and 'B' for animals that give birth to babies:

1. Dog : [B]
2. Bee : [E]
3. Tiger : [B]
4. Shark : [E]
5. Whale : [B]
6. Parrot : [E]

D. Answer the following questions:

1. Reproduction is a process by which an adult organism gives birth to young ones of its own kind. Animals reproduce by giving birth to young ones of their own kind. Other animals give birth by laying eggs. It is because of the process that the life continues on the Earth.
2. Mammals reproduce by giving birth to young ones of their own kind.
3. The structure of an egg is as follows:

   Egg Shell : It is hard, protective shell of egg. It covers the egg and is called egg shell.

   Albumen : Albumen is a white, jelly-like substance. It is rich in proteins. Albumen protects the embryo from shocks and provides it with water.

   Yolk : It is inner part of egg. Yolk is round, yellow-coloured part which is rich in minerals, fats and vitamins. It provides food to embryo.

   Embryo : The yolk has a red spot in centre. This spot is called Embryo. The Embryo develops into a chick. Chick gets its food from the yolk. As chick (baby bird) starts growing, size of yolk gets reduced. When baby bird grows full, egg shell breaks and baby bird comes out.
4. Four stages in the life of a butterfly are as follows:
   1. Egg : Female butterfly lays eggs on a leaf.
   2. Caterpillar : The butterfly that hatches from egg is called a Larva. It looks like worms. The larva of a butterfly is called caterpillar.
   3. Pupa : Caterpillars feeds on leaves and form a shell called cocoon around it. This stage is called pupa.
   4. Adult Butterfly: Caterpillar in the pupa undergoes metamorphosis and finally an adult butterfly comes out of pupa.
5. Birds take care of their young ones after they are born. Parental care is highly developed in birds. The baby birds that thatch out from eggs are featherless. They are very weak. They cannot fly. The mother and father feed the babies. When baby birds grow bigger, their parents teach them to fly and find their food.

HOTS Questions

1. Frogs and fish lay thousands of eggs because only a few of them grow into adults.
2. Birds build their nests in a safe place so that they can safely hatch the eggs from which baby birds finally come out.

Activity Time

Ostrich

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4. Adaptation in Animals

EXERCISES

A. Choose the correct option:

1. (c) Fish 2. (c) Camel
3. (c) Whale 4. (a) Bat
5. (c) Ostrich 6. (a) talon

B. Write 'True' or 'False':

1. [True] 2. [True] 3. [True]
4. [True] 5. [True] 6. [True]

C. Write two examples of each of the following:

1. (i) Cows (ii) Goat
2. (i) Lion (ii) Tiger
3. (i) Bear (ii) Crow
4. (i) Vultures (ii) Hyenas
5. (i) Mosquitoes (ii) Leeches

D. Answer the following questions:

1. Camel adapts itself in desert because of the following reasons:
   1. Camel can live without food and water for many days. Camel has very thick skins to prevent loss of water. When food is available, it eats plenty of it. It gets energy from fat stored in its hump

in the form of fat. It uses extra fat when food is not available.

2. Camel has padded feet that do not sink in soft sand and help it walk easily.
3. Camel's long legs keep its body much above hot sand.
4. Camel has hair on its eye-lashes and in its nostrils. These hair prevent sand to enter in its eyes and nostrils.
5. Camel sweats very little to save water. It also excretes very little urine.
6. Camel can raise its body temperature as much as 107.60C when it is very hot.

Due to the above reasons, camel is called 'Ship of Desert'.

2. Polar Bear lives in Polar Regions which are covered with snow throughout the year.

Special features which are found in the Polar Bear are as follows:

1. Body of Polar Bear is covered with hollow hair. These hair trap air and keep its body quite warm.
2. Polar Bear has a thick layer of fur over its body which protects it from cold. This thick layer of fat under its skin is called blubber which keeps it warm.
3. Polar Bear has hairy soles that do not slip on the snow.
4. Polar Bear has white colour that merges with snow and help in hunting and also helps to escape from enemies.
5. Polar Bear is an excellent swimmer.

3. Fish adapt itself in water in the following ways:
   1. Body of fish is streamlined, broad in middle and narrow at ends. Body helps fish to cut through water easily.
   2. Scales on body are shiny and slimy. They do not allow water to stick to body.
   3. Fins help fish in swimming, maintaining balance and changing direction in water.
   4. Gills of fish have numerous blood vessels. When water passes through gills, blood absorbs oxygen from water and carries it to different parts of body.
   5. Many fish have air-filled pouches called swim bladders in their bodies which make body light so that fish can float easily at any depth in water.
   6. Sharks have a very good sense of smell. They can detect one part of animals blood in 100 million parts of water
   7. Whales, Seals and Walruses have a layer of fat under their skin. This is called blubber. Blubber keeps them warm. They can survive in temperatures as low as – 600C.
4. Amphibians live both on land and in water because their special features help them to survive in both habitats. They breathe through lungs on land and through their moist skin in water. Frogs, toads, salamanders, tortoise are some Amphibians. Frogs have strong back legs to jump on land. Their feet are webbed to swim in water. The eyes of Amphibians have a special skin to protect them in water.

   Amphibians are also called cold blooded animals. They cannot tolerate extreme cold or hot. So, they go for a long sleep during summer and winter. The winter sleep is called Hibernation and summer sleep is called aestivation.
5. Scavengers are animals that feed on the flesh of dead animals. They do not catch their prey. Vultures, Hyenas, Hawks and Jackals are Scavengers. They are called the 'sweepers of the jungle' as they help in keeping the jungle clean by eating dead animals. Vultures have sharp eyes to scan the ground for dead bodies. They have very weak beaks, so they cannot eat fresh flesh.
6. Bats have very poor vision. They use Echolocation to locate their prey. In echolocation, a bat sends out sounds to its prey. This sound comes back to it and helps the bat to locate its prey. They have an excellent sense of hearing.

E. Give Reasons:

1. Reason: Whales and seals have to come up to the surface of water from time to time because they use their lungs, as humans, to breathe air also. That's the reason why they come to the surface of the ocean.
2. Reason: Ducks and frogs have webbed feet because they enable them to swim in the water very easily.
3. Reason: Fish have a streamlined body and its body is broad in the middle and narrow at

the ends. Body helps fish to cut through water easily. Because of this they are able to swim in water easily.

4. Reason: Zebra lives in large groups because their numbers confuse and confound the enemy as it cannot decide which one to make its target.
5. Reason: Scavengers are called 'sweepers of the jungle' because they help in keeping the jungle clean by eating dead animals. Scavengers are animals that feed on the flesh of dead animals. They do not catch their prey. Vultures, Hyenas, Hawks and Jackals are Scavengers. They have very weak beaks, so they cannot eat fresh flesh.
6. Reason: The bones of a bird are hollow and light and because of this they have very little weight. The little weight helps them to fly for a longer time in the air.

HOTS Questions

1. Firstly, Owl has excellent vision and hearing which help it better at night time. In addition, the cover of darkness helps them avoid predators as well as to attack prey.

   Secondly, their feathers hardly make any noise when they fly.

   Thirdly, their prey also becomes active at night. Hence, it becomes easier for them to hunt their prey at night.
2. Crocodiles often eat stones because stones help them with basic digestion. Stones in a crocodile's stomach help it to crush, grate and grind food.

   Stone swallowing is especially beneficial for crocodile because it eats whole prey, particularly animals with shells and tough bones. They don't eat part of animals. Therefore, stones help it in digestion.

Activity Time

A. Do it yourself.

B. World Wildlife Fund (WWF) is an international Non-Governmental Organization founded in 1961. It works in the field of wildlife preservation and reduction of human impact on environment. It has been working in 100 countries including India.

   World Wildlife Fund has its office in New Delhi and various states. It is one of India's leading conservation organizations.

5. Food and Digestion

EXERCISES

A. Choose the correct option:

1. (b) Proteins 2. (a) mouth
3. (d) dehydration
4. (c) small intestine 5. (b) Proteins

B. Write 'True' or 'False':

1. [True] 2. [True] 3. [True]
4. [True] 5. [True] 6. [True]

C. Write the method of cooking of each of the following food items:

1. Chapati : Roasting
2. Parantha : Shallow Frying
3. Popcorn : Roasting
4. Chicken : Roasting, Frying
5. Rice : Steaming, Boiling
6. Cake: Baking

D. Do it yourself.

E. Give Reasons:

1. Reason: After chewing for sometime, rice and bread taste sweet.

   When we chew slowly, the starch present in them gradually starts converting into sugar by the action of enzyme called salivary amylase present in our mouth. Hence, rice and bread tastes sweet.

   Chapatti is carbohydrate and it presents starch. When salivary gland secrets saliva, the carbohydrates changes into simple Glucose i.e. Hexose.
2. Reason: A physical labour eats only chapatti but still can work more because Chapatti contains carbohydrate and it presents starch. When salivary gland secrets saliva, the carbohydrates changes into simple Glucose i.e. Hexose.
3. Reason: Small children need more protein-rich diet because proteins help their body grow properly. They build muscles and repair the tissues. Meat, fish, eggs, pulses, milk and soya bean are good sources of proteins.
4. Reason: Eating more roughage helps in keeping our stomach clean because main function of roughage is to move wastes through stomach and throws it out of the body. Cereals, raw vegetables such as carrot, radish, cabbage, cucumber and fruits are rich sources of roughage.
5. Reason: Spices are added to our food while

cooking because they make the food tasty and because of this we eat a little more quantity of food.

F. Answer the following questions:

1. The main nutrients in the food are:
   1. Carbohydrates
   2. Fats
   3. Proteins
   4. Vitamins
   5. Minerals
2. A balanced diet contains all the nutrients in right amount. A Balanced Diet contains proteins, carbohydrates, fats, vitamins and minerals in the right amount. A balanced diet keeps us healthy and happy. A balanced diet may contain Bread, Chapatti, Rice, Meat, Fish, Milk, Fruits and Vegetables, roughage and Water.
3. When we eat food, teeth start breaking it into smaller pieces which is called mechanical digestion. Saliva in mouth mixes with food to make it soft and easy to swallow. Food then enters food pipe which pushes it down to stomach.
4. The main function of villi in small intestine is to absorb the important nutrients from the food. The walls of small intestines has many fingerlike projections which are called villi. The nutrients absorbed by villi go into the blood. The blood carries them to different parts of the body.
5. Preservation means keeping something safe. Different methods of food preservation are as follows:
   1. Vegetables, fruits and cooked food can be preserved for a long time in a refrigerator. Germs do not grow at low temperature.
   2. Milk is boiled because boiling kills germs.
   3. Vegetables and fruits can be preserved for many days in a cold storage.
   4. Some fruits and vegetables can be preserved by pickling them.
   5. Milk powder, raisins and potato chips are preserved by dehydrating them. It is called dehydration which makes food dry by removing water from it.
6. The main functions of water and roughage are as follows:

   Roughage : Roughage is fibrous part of food which cannot be digested by body. Some portion of food that we get from plants is not digested, but help in digestion. Roughage are found in fruits, vegetables, grains and legumes. Roughage helps in keeping our stomach clean. Roughage moves wastes through stomach and throws it out of body. Cereals, raw vegetables such as carrot, radish, cabbage, cucumber and fruits are rich sources of roughage.

   Water : Water is essential part of diet and helps us in many ways. It helps in digestion and maintains body temperature. At least 8 glasses of water should be taken every day. It helps in proper functioning and removal of waste from body.

HOTS Questions

1. People in cold regions eat more fats because in cold months, they might end up feeling more hungry because body needs to burn more energy to keep its temperature. Fats contain more energy compared to other food items. This is the reason why people in cold regions eat more fats.
2. Milk is called the complete food because milk is the source of all nutrients like carbohydrates, fats, minerals, proteins and vitamins.

Activity Time

A. Do it yourself. B. Do it yourself.
C. Do it yourself.

6. Teeth and Microbes

EXERCISES

A. Choose the correct option:

1. (b) 4 2. (a) incisors
3. (d) protozoans 4. (c) viruses
5. (c) Fungus

B. Fill in the blanks with the words given in the Help Box:

1. Milk teeth fall out at the age of six.
2. Teeth grow from small patches of tissue.
3. The acid dissolves the enamel of the tooth.
4. A balanced diet keeps the teeth healthy.
5. Fungi do not have chlorophyll.

C. Write 'True' or 'False':

1. [True] 2. [False] 3. [True]
4. [True] 5. [True]

D. Answer the following questions:

1. The main functions of teeth are as follows:
   a) They help us to chew the food we eat.

b) They give shape to our face.
c) They help us to speak clearly.
d) Teeth make digestion easy.
e) Teeth make our smile charming.

2. Difference between milk teeth and permanent teeth is as follows:

Milk Teeth : Milk teeth are also called temporary teeth or Primary Teeth. First full set of 20 teeth that appear at the age of 7 – 9 months are called Milk Teeth. By the age of 6 – 7 years, these teeth begin to fall. Another set of larger teeth replace them.

Permanent Teeth: When we are 21years old, we have full set of 32 teeth. If they fall off, they do not grow. They are called Permanent Teeth.

3. The four kinds of teeth in human beings are as follows:
   1. Incisors : There are 8 Incisors: 4 on each jaw. They are placed at front. They help bite food we eat.
   2. Canines : There are 4 Canines: 2 on each jaw. A canine is placed next to Incisors on either side. They are used to tear off flesh. Carnivores like tigers, wolves and dogs have very sharp and pointed Canines.
   3. Premolars : There are 8 Premolars: 4 on each jaw and 2 on either side. They are placed between Canines and Molars. They are broad and strong. They are used to chew food.
   4. Molars : There are 12 Molars: 6 on each jaw and 3 on either side. They are flat, broad and strong teeth that help grind food. They are placed at back after Premolars on each side.

4. The structure of a tooth is as follows:

There are 2 main parts of a tooth –Crown and Root. Top part of tooth visible above gum is called Crown. Below crown inside gum is called Root. Root holds tooth to its place.

There are three layers of a tooth:

(i) Enamel : It is outer white layer. It is hardest substance in a human body.

(ii) Dentine : It lies below Enamel. It is slightly yellow in colour. It is not as hard as the enamel.

(iii) Pulp : It is innermost layer of tooth. It is soft and consists of blood vessels and nerves. It sends signals to brain.

5. Microbes are organisms that can be seen only through a microscope. They are everywhere: in air, water and soil. Some microbes are useful while others are harmful. There are 4 categories of microbes Bacteria, Fungi, Protozoa and Virus.

Some diseases caused by microbes are as follows:

1. Pneumonia, Tuberculosis, Typhoid and Diptheria are caused by Bacteria. Bacteria is a single celled organism. They are found in air, soil, plants and animals.
2. Polio, Flu, Measles, AIDS and Mumps are caused by viruses. Viruses are even smaller than bacteria. They don't exist on their own. They invade a plant or animal cell. They are regarded as a link between living and non-living.
6. We can take care of our teeth as follows:
   1. Make sure that movement of brush is in both upward and downward directions.
   2. Use a dental floss to clean food particles stuck between teeth.
   3. Brush teeth lightly.
   4. Wash and rinse mouth after every meal.
   5. Avoid eating lots of sweets and soft drinks.
   6. Eat fruits and vegetables rich in Vitamin C.
   7. Visit dentist at regular intervals for check-up.
7. If we do not take proper care of our teeth, a sticky layer of plague gets deposited on teeth. It is made up of germs that live in mouth. They feed on the bits of food particles stuck in teeth and produce an acid that gradually makes a hole in tooth called cavity. If not treated in time, the cavity can reach the pulp that can cause severe pain in the tooth.

HOTS Questions

1. Rodents (rats, squirrels) have very sharp teeth because they are gnawing animals. They have sharp front teeth and strong flat back teeth. They eat seeds, fruits and nuts. They hold their food with their front legs and use their front teeth to crack open the food. They chew it e.g. squirrels, rats, rabbit gnaw their food.
2. Lions, tigers and cats have two canines in each jaw. They are on both sides of the incisors. They are long and pointed. They help in tearing the food. So, they are also called tearing teeth. Lions, tigers and cats have these tearing teeth and hence, they are

called canines.

Activity Time

Do it yourself.

7. First Aid

EXERCISES

A. Choose the correct option:

1. (d) bone fracture 2. (b) venom
3. (b) dog

B. Write the First Aid you will give to the following persons:

1. Antiseptic cream Burnol.
2. Sling to support the arm.
3. Milk and Water
4. Put a cloth soaked in cold water on child's forehead several times.

C. Answer the following questions:

1. A few precautions to avoid electric shock are as follows:
   1. Do not use water to put off fire as we can be electrocuted.
   2. Switch off main power supply.
   3. Never touch the victim before switching off main power supply line.
   4. Use sand or fire extinguishers.
   5. Make a victim to lie down and call for a doctor immediately.
2. If a child swallows any poisonous substance, we should do the following:
   1. Send someone for a doctor immediately.
   2. In the meanwhile, give the person milk and water.
   3. Try to make the person vomit.
3. Bites of some animals like monkeys, dogs, rats can cause Rabies.

First Aid to be given for rabies is as follows:

1. Send some for a doctor immediately.
2. In the meanwhile, wash the wound with clean running water continuously to remove germs.
3. Apply an antiseptic cream to stop infection.
4. Tie a bandage on the wound.

4. We should do the following help a drowning person:
   1. Send someone for a doctor immediately.
   2. In the meanwhile, make the person lie down with stomach on the ground.
   3. Press person's back to remove excess water through mouth.
   4. Try to him the person artificial breathing.
   5. Take the person to a doctor immediately.

HOTS Questions

1. Expiry Date on the labels of medicines indicate that the potency of the medicine may start decreasing after the expiry date. The medicine will continue to be effective, but the result may not be as effective as desired.
2. Liquid medicines should be taken after shaking the bottles because concentration of main element might have deposited at the bottom of the bottle. In order to have homogenous concentration of medicinal content, liquid should be shaken before use.

Activity Time

A. COBRA

B. Do it yourself.

8. States of Matter

EXERCISES

A. Choose the correct option:

1. (d) juice 2. (c) steam
3. (a) melting 4. (d) water
5. (a) wax

B. Write 'True' or 'False':

1. [True] 2. [True] 3. [True]
4. [True] 5. [True]

C. Name any three solids and liquids (other than mentioned in the lesson):

1. (i) Gold (ii) Silver (iii) Stone
2. (i) Juice (ii) Milk (iii) Pepsi

D. Answer the following questions:

1. Matter is anything that occupies space and has mass. Matter is made up of very tiny particles called molecules.
2. Three states of matter are as follows:
   1. Solid
      - Particles are packed very close to one another.
      - They have definite shape and volume.
      - They do not flow.
      - They cannot be compressed.
      - Examples: Ice cubes, building, bed, book.
   2. Liquid

- Particles are not packed very close to one another.
- They don't have definite shape, but have a definite volume.
- They flow.
- They cannot be compressed easily.
- Examples: Milk, juice, soup, water.

3. Gas
   - Particles are packed very far away from one another.
   - They have neither definite shape nor definite volume.
   - They flow.
   - They can be compressed easily.
   - Examples: Oxygen, Carbon Dioxide.

3. Matter changes its state in the following ways:

   Freezing : Freezing is a process by which liquids change into solids on cooling. Example: water when placed in freezer turns into ice.

   Melting : Melting is a process by which a solid changes into a liquid on heating. When ice (solid) is kept out of refrigerator, it melts into water (liquid).

   Evaporation : Evaporation is a process by which a liquid changes into a gas on heating. When water (liquid) is heated, it changes into water vapour (gas).

4. Different processes involving changes in the state of matter are as follows:

   Melting : Melting is a process by which a solid changes into a liquid on heating. When ice (solid) is kept out of refrigerator, it melts into water (liquid).

   Freezing : Freezing is a process by which liquids change into solids on cooling. Example: water when placed in freezer turns into ice.

   Evaporation : Evaporation is a process by which a liquid changes into a gas on heating. When water (liquid) is heated, it changes into water vapour (gas).

5. Difference between soluble and insoluble substances is as follows.

   Soluble : Soluble substances are those substances that dissolve in water. For example, salt and sugar are soluble in water.

   Insoluble : Insoluble substances are those substances that do not dissolve in water. For example, chalk powder and pencil shavings are insoluble in water.

6. Difference between a solute and a solvent is as follows:

   Solute : Solute is that substance that dissolves in a liquid to form a solution. Example: Sugar.

   Solvent : Solvent is that substance in which solute dissolves to form a solution. Example: Water.

7. When we put sugar into water, sugar breaks up into molecules. These sugar molecules spread into water and occupy the spaces between water molecules. This is the reason why the volume of water does not change when we add sugar into it.

E. Give Reasons:

1. Reason: Solid particles are packed very close to one another. They have definite shape and volume. They do not flow. They cannot be compressed. Examples: Ice cubes, building, bed, book.
2. Reason: Liquids particles are not packed very close to one another. They don't have definite shape, but have a definite volume. They flow. They cannot be compressed easily. Examples: Milk, juice, soup, water.
3. Reason: Gases particles are packed very far away from one another. They have neither definite shape nor definite volume. They float easily. They can be compressed easily. Examples: Oxygen, Carbon Dioxide.
4. Reason: The fragrance of an agarbatti or perfume spreads in all over the room because gas particles are packed very far away from one another. They have neither definite shape nor definite volume. They float easily.
5. Reason: If we keep a glass of chilled water on table, tiny droplets of water appear on the glass after some time because there is great amount of difference between the temperature inside the glass and outside the glass.

HOTS Questions

1. If we put wax in kerosene, it disappears because the hydrocarbon wax molecules can burn completely. When we light a candle, wax near the wick melts into a liquid. The heat of flame vaporizes the wax molecules and they react with the oxygen in air.

2. We can't put a solid into space which is too small for it because the articles are far apart from each other. Also, there are very weak forces of attraction between

them. Because of this, gases don't have a definite shape or volume and fill any container.

Activity Time

A. ATOM

B. Do it yourself.

9. Force, Work and Energy

EXERCISES

A. Choose the correct option:

1. (b) Force 2. (b) Gravity
3. (b) Sun 4. (d) Sun
5. (a) CNG 6. (a) Water

B. Write 'True' or 'False':

1. [True] 2. [False] 3. [True]
4. [True] 5. [True] 6. [True]

C. Tick (✓) the correct words given in the brackets:

1. Friction is more on rough surfaces.
2. The Earth pulls everything towards it through gravitational force.
3. Water stored in a dam has potential energy.
4. Hydroelectricity is produced from water .
5. CNG is a pollution-free fuel.
6. Energy stored in a torch battery is called chemical energy.

D. Answer the following questions:

1. A push or a pull action is called Force.

   Four things that a force can do are as follows:

   1. When we apply force, it creates movement such as a table moves, branch of a tree waves, water flow moves a boat, a bull pulls a cart, a ball, moves, a pencil or pen moves.
   2. Force changes speed and direction of object as happens in case of cricket and hockey ball.
   3. Force can make things speed up, slow down or change direction.
   4. Force can change the shape of an object.

2. When force is applied on an object and that object moves in the direction of force applied, we say work is done.

   If a man carries a bag on his head and climbs stairs, work is done because he moved a distance.

   But if the man stands at one place without moving with bag on his head, then no work is done because he doesn't move at all.

   If a person pushes a wall, he doesn't do any work because the wall doesn't move.

   Work is done only if there is distance covered.

3. Energy is the capacity of a body to do work. Energy is ability to do work. There are different forms of energy.

   Three forms of energy are as follows:

   Electrical Energy: Fans, washing machine, refrigerator and other electrical appliances work on electricity because electricity has energy. It is known as electrical energy.

   Solar Energy : The energy that we get from sun is called Solar Energy. It is needed by plants, animals and human beings. Sun's heat dries wet clothes. A solar cooker uses sun's heat to cook food. Solar Geyser uses solar energy to heat water. Solar energy is used for producing electricity.

   Wind Energy : The energy of moving air can be used for rotating a windmill. When a windmill rotates, its moves machines called Turbines which generate electricity. This energy is used for grinding grains, pumping water out of a well and for sailing a boat in water.

4. A tool or device that makes our work easier and faster is called a Simple Machine.

Different types of simple machines are as follows:

1. Wheel and axle - Steering Wheel, bicycle pedal
2. Pulley - Water drawn from a well
3. Lever - Scissors
4. Screw - Bottle opener, Screw driver
5. The different sources of energy are as follows:
   1. Solar Energy : The energy that we get from sun is called Solar Energy. It is needed by plants, animals and human beings. Examples: Solar Cooker, Solar Geyser.
   2. Wind Energy : The energy of moving air is called Wind Energy. It is used for rotating a windmill, grinding grains, pumping out water and sailing a boat in water.
   3. Electrical Energy: Fans, washing machine, refrigerator and other electrical appliances work on electricity.
   4. Heat Energy : Heat Energy is obtained from burning of fuels like

LPG (Liquefied Petroleum Gas), coal, petroleum, etc. Sun is natural source of heat energy.

5. Hydroelectricity : Hydroelectricity means electricity produced by water.
6. Fossil Fuels : Coal, Petroleum, Natural Gas
7. CNG : Pollution-free fuel

6. Energy can be changed from one form into another as follows:
   1. Bulb and Tube-lights, electrical energy changes into light energy.
   2. Transistors and Call Bells change electrical energy into sound energy.
   3. Iron press and heaters change electrical energy into heat energy.
   4. A solar Cooker changes solar energy into heat energy.
7. We can conserve energy in the following ways:
   1. We should use Sun's Solar Energy, Wind Energy, Water Energy, etc. We should use more of these sources because they are inexhaustible sources of energy.
   2. We should try our best to reduce our dependency on coal and mineral oils.
   3. Keeping computer on standby mode when I am not using it.
   4. Switching off lights and fans when I leave my room.
   5. Using electrical gadgets only when necessary.

HOTS Questions

1. Write the sources of energy of the following objects. Use words given in the help box.

1. Aircraft - Fuel
2. Train - Electricity
3. Computer - Magnet
4. Glider - Wind
5. Clock - Battery Cell

Activity Time

A. Do it yourself. B. Do it yourself.
C. Do it yourself.

10. The Changing Weather

EXERCISES

A. Choose the correct option:

1. (b) Mumbai 2. (b) dew
3. (a) fog 4. (a) frog
5. (a) sea breeze

B. Write 'True' or 'False':

1. [True] 2. [False] 3. [True]
4. [True] 5. [True] 6. [True]

C. Define the following terms:

1. Weather : Weather is defined as condition of air temperature, air pressure, wind, humidity and rainfall in atmosphere at a given place and time. It can change from day to day and even from hour to hour. On a sunny day, we can expect a sudden rush of clouds and rainfall may start. We may experience different weather condition in morning and in evening.
2. Evaporation : When sun heats up water, it changes into vapour. Process in which water changes to water vapour on heating is called Evaporation. Process of evaporation is affected by strong wind, large Surface, temperature and dry weather.
3. Condensation : When water vapour is cooled, it forms droplets of water. Process in which water vapour changes to water on cooling, it is called Condensation. When water condenses, it forms clouds. Clouds fall as rain. Water also exists in other forms like snow, dew, fog and frost.
4. Hibernation : Hibernation is the process of going to warmer places for safety during winters. Hibernation is also called winter-sleep. Some animals like cockroach, mosquitoes can only be seen in summers. Frogs, Earthworms, Snakes, etc. dig burrows and holes and go for a long sleep in them. They come out when climate is favourable.
5. Land Breeze : At night, land cools down faster than sea. Hot air above seas rises up. Cold air from above land rushes in to take its place. So, during night, cold air from land moves towards sea thus setting up a land breeze.
6. Sea Breeze : During day, sun heats up water and land, but land gets heated up quickly. Air above it becomes hot and rises up creating a vacuum. Cold air above water rushes into take its place. So, a cool breeze blows towards land during day. This is Sea Breeze.

D. Give reasons:

1. Reason: Days are hot in the deserts because

during the day, sun heats up land in deserts quickly. Air above it becomes hot and rises up.

Nights are cold in the deserts because during the night, land in deserts cools down very quickly. Air at ground surface becomes very cool and therefore, nights are cold in the deserts.

2. Reason: Sea breeze keeps the coastal areas cool. The coastal areas remain less hot during the daytime as it is surrounded by sea. During day, sun heats up water and land. But land gets heated up quickly. Air above it becomes hot and rises up creating a vacuum. Cold air above water rushes into take its place. So, a cool breeze blows towards land during day. Therefore, the coastal areas experience pleasant weather during the daytime.
3. Reason: Clothes dry faster in dry air than in humid air because dry air is warmer than humid air. The humid air contains more water vapour and this is the reason why the clothes dry faster in dry air.
4. Reason: Fog is a smoke-like thing seen very near the ground in a winter morning. The dust particles float in air. When moist air comes into contact with cold air, it gets cooled. Some of the water vapour in air condenses on these particles and forms fog. As soon as sun shines, the water evaporates and the fog also disappears. Therefore, in chilly winter mornings, there is fog but after sometime it disappears.
5. Reason: This is because the part of our hands which are kept to the sides of flame, they do not feel. The sides of a flame are less temperate zone than the one that directly faces the flame. The far we go from the flame, the cooler we feel. This is the reason why if we keep our hands close to the sides of a flame, we do not feel hot.
6. Reason: At noon, the sun is straight over our head and the sunrays fall directly upon us. This is the reason why noons are hotter than mornings and evenings. In the mornings and evenings, the sunrays are slanting because the sun is farther from us.

E. Answer the following questions:

1. The Sun called 'Nature Weatherman' because it is the sun which causes all changes in the weather.
2. The sun warms both land and water. The land becomes warm more quickly than water. It also gets cooled more quickly. At night land cools faster than water.

   The unequal heating and cooling of land and water gives rise to following two types of breezes:

   Land Breeze : At night, land cools down faster than sea. Hot air above seas rises up. Cold air from above land rushes in to take its place. So, during night, cold air from land moves towards sea thus setting up a land breeze.

   Sea Breeze : During day, sun heats up water and land. But land gets heated up quickly. Air above it becomes hot and rises up creating a vacuum. Cold air above water rushes into take its place. So, a cool breeze blows towards land during day. This is called Sea Breeze.
3. We take a cardboard and a wooden box with a glass front. We fit two wide glass tubes in holes at top to form chimneys. We put a small lit candle below one chimney. We hold a smouldering piece of paper at top of other chimney Air above candle gets heated and becomes lighter. Air rises up. Smoke from smouldering paper rushes into box to take the place of warm air. This proves that hot air rise up.
4. Clouds are formed when water from oceans, seas, rivers, ponds and lakes changes into water vapour due to sun's heat. The water vapour rises up in the air. Higher up in sky, it cools down and changes into small droplets of water. These droplets of water form clouds.
5. Weather affects our day-to-day life to a great extent. In cold weather, we have to protect ourselves against cold. We keep our houses warm. In hot weather, we protect ourselves against heat.

   Changes in weather also affect animals and plants. Animals such as frogs, lizards and salamanders go for a long sleep during extreme cold. This phenomenon is called hibernation. Similarly, many plants shed their leaves in cold weather to protect themselves against cold. Rate of photosynthesis slows down during the winter.
6. Water Cycle is as follows:
   - Due to heat of sun, water from oceans, seas, rivers, ponds and lakes changes into water vapour.

- Water vapour rises in the air. High up, it cools down and changes into small drops of water. These drops of water form clouds.
- Inside the cloud, more water drops join and become large drops. Large drops, on becoming heavier, fall on Earth as rain.
- Rainwater falls into oceans, seas, rivers, ponds and lakes and fills them. This water gets heated again by sun and changes into water vapour.
- This cycle is repeated and is called water cycle.

7. The water vapour that goes into atmosphere does not remain there for a long time. When it cools down, it changes in tiny droplets of water again. The change of water vapour into water is called condensation.

   Few examples of condensation in nature are as follows:

   1. Clouds : When water vapour comes in contact with cold air, it changes into small droplets of water. These droplets cling together to form clouds. This is called condensation.
   2. Rain : When the droplets (clouds) become heavier, they fall on the ground as rain. This is what we call the water cycle.
   3. Dew : During day, everything absorbs heat. At night, this heat is given out. Grass, flowers and leaves give out heat more quickly. They become very cold. When moist air touches them, it also becomes cold. It cannot hold the water vapour. This water vapour condenses on grass and leaves in the form of shining droplets. This is called dew.
   4. Frost: In extreme winter, earth becomes very cold. Its surface becomes colder than ice. The dew droplets free and become frost. The frost causes great damage to crops.
   5. Fog : The dust particles float in air. When moist air comes into contact with cold air, it gets cooled. Some of water vapour in air condenses on these particles and forms fog. As soon as sun shines, the water evaporates and the fog also disappears. Therefore, in chilly winter mornings, there is fog but after sometime it disappears.
   6. Hail : When raindrops fall towards the earth and the wind is blowing at a great speed, it carries rain drops upward into colder regions. They freeze and become hail. They fall on earth as hail stones.
   7. Snow : When clouds move up because of strong winds to very cold regions, the water vapour freezes. They fall as snow. Snow is light. It falls on high mountains in winter. When snow becomes hard, it forms ice.

HOTS Questions

1. Condensation on outside of a car is caused when warm, moist air often present in early morning hours condenses when it hits car's colder window glass. When it's cold enough, the condensation turns to frost seen on car.
2. Ventilators are constructed above the windows because the hot air that rises up may have an outlet to go out. It leads to keeping the room cool and prevent nausea and suffocation in the room.

Activity Time

A. The world's warmest continent is: AFRICA

B. Do it yourself. C. Do it yourself.

11. Purification of Water

EXERCISES

A. Choose the correct option:

1. (b) sweat 2. (d) ocean
3. (c) cancer 4. (a) daily
5. (b) boiling 6. (b) chlorine

B. Write 'True' or 'False':

1. [True] 2. [True] 3. [False]
4. [True] 5. [False]

C. Tick (✓) the correct words given in the brackets:

1. Water is removed from our body as urine .
2. Water from seas and oceans is salty.
3. Impurities that dissolve in water are called soluble impurities.
4. Chlorine kills germs in water.
5. Tap water is safe to drink.
6. Purest form of water is water from rain.

D. Answer the following questions:

1. Six uses of water are as follows:
   1. Washing utensils, clothes, etc.
   2. Drinking 3. Swimming

4. Bathing 5. Irrigation
6. Cooking

2. The various sources of water are as follows:
   1. Rain 2. Pond
   3. River 4. Lake
   5. Sea 6. Streams
3. A few activities that can make water dirty are as follows:
   1. When dirty water by cleaning and washing is allowed to flow into rivers, ponds and lakes.
   2. Washing clothes and bathing in the pond.
   3. Washing animals in the pond.
   4. In big cities and towns, wastes from sewages and factories flow into rivers.
4. We can make water safe to drink in the following ways:
   1. Not allowing anyone to take bath or wash clothes near sources of water.
   2. Not allowing anyone to urinate or defecate near sources of water.
   3. Not allowing dirty water to collect near sources of water.
   4. Allowing dirty water to go into a soakage pit.
   5. Not allowing wastes from sewage and factories to flow into the rivers.
5. Tap water is safe to drink because it is filtered, purified and treated with chemicals in waterworks.
6. We can save water in the following ways:
   1. We should never wash fruits and vegetables with large amount of water.
   2. We should try to take only short showers.
   3. We should turn off the tap when not in use.
   4. Don't leave the tap running while brushing our teeth.
   5. Repair leakage in pipes.

HOTS Questions

Do it yourself.

Activity Time

A. Learn yourself.

B. Do it yourself.

C. Do it yourself.

12. The Solar System

EXERCISES

A. Choose the correct option:

1. (a) Sun 2. (b) 24 hours
3. (d) 24 months 4. (a) 67 Moons
5. (b) Earth 6. (b) Axis

B. Tick (✓) the correct words given in the brackets:

1. The land covers 29% of the Earth's surface.
2. The Earth rotates from west to east .
3. The revolution on the Earth causes seasons .
4. The axis of the Earth is an imaginary line .
5. The stars have their own light.
6. The planets revolve around the sun in a fixed orbit .

C. Write 'True' or 'False':

1. [True] 2. [False] 3. [True]
4. [False] 5. [True] 6. [False]

D. Match the following columns:

English Name	Sanskrit Name
1. Mercury	(f) Budh
2. Venus	(e) Shukra
3. Mars	(d) Mangal
4. Jupiter	(c) Brihaspati
5. Saturn	(b) Shani
6. Uranus	(a) Arun

E. Differentiate between:

1. The difference between stars and planets is as follows:

   Planets : Eight large round objects that move around Sun are called planets. Planets move around Sun in their fixed paths. The fixed path is called its orbit. A planet is much smaller than that of a Star. A planet does not give out light or heat on its own. It shines because it reflects light of Sun. Our Earth is a planet and it is only planet where life exists. There are eight plants – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

   Stars : Stars are huge balls of gases. They give out light and heat. The Sun is a star. It is the star nearest to Earth. Some stars are smaller than Sun and some are thousand times bigger than Sun. Stars shine for millions of years. There are millions of stars in sky. A big group of stars is known as Galaxy. A huge cloud of stars called Milky Way Galaxy is name of galaxy to which Solar System belongs. The stars, the sun and planets are only a very small

part of this galaxy. The Milky Way Galaxy is spiral in shape.

2. The difference between stars and planets is as follows:

   Planets : Eight large round objects that move around Sun are called planets. Planets move around Sun in their fixed paths. The fixed path is called its orbit. A planet is much smaller than that of a Star. A planet does not give out light or heat on its own. It shines because it reflects light of Sun. Our Earth is a planet and it is only planet where life exists. There are eight plants – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

   Satellites: Satellites are heavenly bodies that revolve around planet. Moon is natural Satellite of earth. Jupiter has 39 moons orbiting around it.

   With development of science, man has invented Satellites that are launched in space and help in forecasting weather conditions, rainfall, etc. They also enable us to watch live programmes on our television screen.

3. The difference between Natural Satellite and Artificial Satellite is as follows:

   Natural Satellite : A natural satellite is a heavenly body that revolves around the planet. Moon is the only natural satellite of Earth. Other planets also have their satellites.

   Artificial Satellite : Artificial satellite is one that is launched in space. It helps in forecasting weather conditions, rainfall, etc. It also enables us to watch live programmes on our television screen.

4. The difference between Natural Satellite and Artificial Satellite is as follows:

   Rotation: Rotation is movement of Earth on its axis. It rotates from west to east and it takes 24 hours to complete one rotation. Days and nights are formed because of rotation of Earth. This causes days and nights. During rotation, part of earth that faces sun has day and other part has night.

   Revolution: Revolution is movement of Earth around Sun. In its orbit, Earth completes one revolution in 365.25 days. The period of 365.25 days together make a year. Seasons are formed because of revolution of Earth.

F. Give Reasons:

1. Reason: Planets do not collide with each other when they move around the Sun because they move in a fixed path called orbit.
2. Reason: Earth is called the 'Blue Planet' because 70% of its surface is covered with water and from the sky it looks blue in colour.
3. Reason: The craters on the Moon will never change in future because there is no air and water on Moon and there is also no weather. As a result, there will be no creation in the absence of any kind of movement. Since there is no movement of any kind whatsoever, the things will remain forever as it is.
4. Reason: The Moon has different phases because of its movement and only that part of moon receives sunlight that faces the sun at a particular time.
5. Reason: This is because Sun is near to Earth compared to other stars. The stars are comparatively very far from Earth. Therefore, Sun appears very big while other stars just seem as points in the sky.

G. Answer the following questions:

1. The Solar System consists of Sun and the eight planets.

   Name of different planets of the Solar System are:

   1. Mercury - The smallest planet
   2. Venus - The brightest planet
   3. Earth - The only planet where life exists
   4. Mars - The Red planet
   5. Jupiter - The largest planet
   6. Saturn - The planet with rings
   7. Uranus - The second farthest planet
   8. Neptune - The farthest planet

2. Rotation : Rotation is movement of Earth on its own axis. It takes 24 hours to complete one rotation. It causes day and night. Part of Earth that faces Sun has day and other part has night.

   The effect of rotation on Earth is that it causes day and night. Part of Earth that faces Sun has day and other part has night.

   Revolution : Revolution is movement of Earth around Sun. In its orbit, it completes one revolution in 365.25 days. The effect of revolution on earth is that it causes the

different seasons and 365.25 days together constitute a year.

3. Rotation is movement of Earth on its own axis. It takes 24 hours to complete one rotation. It causes day and night. Part of Earth that faces Sun has day and other part has night.

   The effect of rotation on Earth is that it causes day and night. Part of Earth that faces Sun has day and other part has night.

4. Constellations are group of stars making some pattern in sky. Constellations are named after creatures and persons from myths or legends.

Name of two well-known constellations are:

(i) Ursa Major and Minor

(ii) Great Bear (known as Sasptarishi in India)

5. A Satellite is a heavenly body that revolves around the planet. Moon is natural Satellite of earth. Jupiter has 39 moons orbiting around it.

   With development of science, man has invented Satellites that are launched in space and help in forecasting weather conditions, rainfall, etc. They also enable us to watch live programmes on our television screen. Hence, satellites are very useful to us.

6. Revolution is movement of Earth around Sun. In its orbit, it completes one revolution in 365.25 days. The effect of revolution on earth is that it causes the different seasons and 365.25 days together constitute a year.

HOTS Questions

1. The footprints left by Neil Armstrong on Moon in 1969 are still there because there is no air and water on Moon and there is also no weather. As a result, there will be no creation in the absence of any kind of movement. Since there is no movement of any kind whatsoever, the things will remain forever as it is.
2. We cannot hear sound on the Moon because there is no air. Sound needs air to travel around. In the absence of air on Moon, we cannot hear any sound on Moon.

Activity Time

A. Do it yourself. B. Do it yourself.

C. Do it yourself. D. Do it yourself.

E. Do it yourself.

13. Our Environment

EXERCISES

A. Choose the correct option:

1. (a) air 2. (d) Cholera
3. (b) deafness 4. (b) pollutants
5. (a) CNG

B. Write 'True' or 'False':

1. [True] 2. [False] 3. [True]
4. [True] 5. [True] 6. [False]

C. Answer the following questions:

1. We see so many things around us like plants, animals, buildings, bridges, vehicles, etc. All living and non-living things around us in our surroundings make up our environment.

   The living things like plants, animals, human beings and microbes constitute Biotic Components of the environment.

   The non-living things like soil, air, water, etc. constitute the Abiotic Components of the environment.

   Both the biotic and abiotic components are interdependent on each other.

2. Human beings and animals are very much dependent on the environment. The environment is very essential for our survival.

   The plants provide us with air to breathe. They also give us food, like vegetables, fruits, cereals, pulses, fibre materials to build our houses.

   Animals also provide us with food like meat, eggs, milk, etc. In return, animals provide carbon dioxide which is used up by plants during the process of photosynthesis.

3. Global Warming and Acid Rain are caused the following ways:

   Global Warming : Due to increase in carbon dioxide, Earth's atmosphere gets polluted. This increase in pollution leads to increase in Earth's average temperature. This is known as 'Global Warming'.

   Three causes of global warming are as follows:

   1. Greenhouse Gases: These gases trap heat, temperature of earth increases. Examples: Release of Carbon Dioxide by vehicles, factory and industrial processes.
   2. Decomposition: Decomposition of organic materials releases Methane

which is a greenhouse gas like Sulphur Dioxide, Nitrous Oxide, Chlorine and Bromine. These gases absorb heat radiations and cause warming of earth's surface.

3. Ozone Layer: It is caused by release of CFC gas used in industries and refrigerators. Ozone Layer prevents harmful sun-rays from reaching Earth. Ultraviolet rays enter Earth's atmosphere and are absorbed by greenhouse gases that increase global warming.

Acid Rain: Acid Rain is caused when carbon dioxide and Sulphur Dioxide gases mix with water vapour in the atmosphere. They react to form an acid and fall on the Earth along with rain. Acid Rain harms crops, forests, buildings and movements.

4. Our environment is getting spoiled by the following:
   1. Cutting of plants and trees.
   2. Construction of buildings, factories, industries, etc.
   3. Nuclear weapons disturb ecosystem.
   4. Skiing and tourism greatly affect natural environment. Such activities intrude into habitats of other living organisms.
   5. Expansion of resorts and facilities add pressure on environment. They erode forest area and the green cover.
   6. Plastic and electronic wastes are affecting the environment.
   7. Burning of coal, wood, petrol and diesel.
   8. Firecrackers on festivals and weddings.
   9. Packets, plastic bags, leftover food.
   10. Noise created by aircrafts, trains, vehicles, construction machines and factories.
   11. Pesticides, insecticides and chemical fertilizers.
5. A few steps to prevent pollution are as follows:
   1. Plant more trees and increase forest cover.
   2. Make less use of vehicles that release toxic fumes into air.
   3. Usage of public transport will help in this regard.
   4. Make less use of refrigerators and air conditioners.
   5. Use recycled products and adopt 3 R's.
   6. Switch to a renewable source of heat and light like Solar Energy, Wind Energy and geothermal energy instead of burning fossil fuels.
   7. Emission of greenhouse gases into atmosphere should be reduced.

HOTS Questions

1. We should not use plastic bags because they block drains. Whenever there is standing water, mosquitoes lay eggs. These spread diseases. We should use cloth or jute bags. Non-biodegradable Wastes like plastic bags do not decompose easily and stay in soil over a long period of time. Non-Biodegradable Wastes harm the environment. We must avoid the use of plastic bags.
2. The Ganga is regarded as a holy river and it has been scientifically proved that the water of Ganga River is not pure, but it also purifies others. But irony is that Ganga which is a purifier has become polluted now-a-days. This is the reason why Ganga is sometimes called the 'polluted purifier'.

Activity Time

Do it yourself.

MODEL TEST PAPER - 1

A. Tick (✓) the correct answer:

1.	(c)	Deserts	2.	(a)	Tulsi
3.	(b)	Conifers	4.	(a)	Lotus
5.	(d)	Water Hyacinth	6.	(b)	three
7.	(d)	birds	8.	(a)	Bear
9.	(a)	proteins	10.	(b)	8

B. Give answer in one word:

1.	Kendelia, Cariops.	2.	Water
3.	Bamboo	4.	Salmon
5.	Bats	6.	Balanced Diet

C. Write 'True' or 'False':

1.	[True]	2.	[True]	3.	[False]
4.	[False]	5.	[True]		

D. Answer the following questions:

1. 'Photo' means light and 'Synthesis' means putting together. Photosynthesis is a process in which green plants make food in the presence of air, water and sunlight. Plant takes in water and minerals from soil by roots. Chlorophyll in leaves traps light energy from Sun. In the presence of Carbon

Dioxide and Air, food-making process starts. Oxygen is released as by-product and food is stored in the form of Starch.

Following things are essential for photosynthesis:

1. Sunlight 2. Water
3. Carbon dioxide 4. Chlorophyll

2. Mangrove have breathing roots that grow out of soil and water to get enough air to breathe. Roots absorb water and other nutrients essential for photosynthesis. Marshy areas are wet, humid with clayey soil and plenty of water. Mangroves are found in these places. Examples: Kendelia, Cariops.

3. The structure of an egg is as follows:

Egg Shell : It is hard, protective shell of egg. It covers the egg and is called egg shell.

Albumen : Albumen is a white, jelly-like substance. It is rich in proteins. Albumen protects the embryo from shocks and provides it with water.

Yolk : It is inner part of egg. Yolk is round, yellow-coloured part which is rich in minerals, fats and vitamins. It provides food to embryo.

Embryo : The yolk has a red spot in centre. This spot is called Embryo. The Embryo develops into a chick. Chick gets its food from the yolk. As chick (baby bird) starts growing, size of yolk gets reduced. When baby bird grows full, egg shell breaks and baby bird comes out.

4. Polar Bear lives in Polar Regions which are covered with snow throughout the year.

Special features which are found in the Polar Bear are as follows:

1. Body of Polar Bear is covered with hollow hair. These hair trap air and keep its body quite warm.

2. Polar Bear has a thick layer of fur over its body which protects it from cold. This thick layer of fat under its skin is called blubber which keeps it warm.

3. Polar Bear has hairy soles that do not slip on the snow.

4. Polar Bear has white colour that merges with snow and help in hunting and also helps to escape from enemies.

5. Polar Bear is an excellent swimmer.

5. The main nutrients in the food are:

1. Carbohydrates 2. Fats
3. Proteins 4. Vitamins
5. Minerals

E. Write two examples of each of the following:

1. (i) Cows (ii) Goat
2. (i) Lion (ii) Tiger
3. (i) Bear (ii) Crow
4. (i) Vultures (ii) Hyenas
5. (i) Pitcher Plant (ii) Venus Fly-trap

F. Tick (✓) the correct words given in the brackets:

1. Potato that we eat is a stem .
2. Desert plants have short roots.
3. Fungi are non-green plants.
4. The larva of a butterfly is called a nymph .
5. Amphibians are also called cold-blooded animals.
6. In leaves exchange of gases takes place through stomata .

G. Do it yourself.

MODEL TEST PAPER - 2

A. Tick (✓) the correct answer:

1. (a) melting 2. (c) Force
3. (c) Sun 4. (a) frog
5. (b) boiling 6. (b) 8
7. (a) Leo 8. (c) deafness
9. (a) burns 10. (c) chemical

B. Choose (✓) the correct words given in the brackets:

1. The axis of the Earth is an imaginary line .
2. The rotation of the Earth causes day and night.
3. Acid Rain is very useful for crops.
4. Global Warming means an increase in the Earth's temperature.
5. A solid has a definite shape.
6. CNG is a cleaner fuel.

C. Answer the following questions in details

1. The various sources of water are as follows:

1. Rain 2. Pond 3. River
4. Lake 5. Sea
6. Streams

2. Rotation is movement of Earth on its own axis. It takes 24 hours to complete one rotation. It causes day and night. Part of Earth that faces Sun has day and other part has night.

The effect of rotation on Earth is that it causes

day and night. Part of Earth that faces Sun has day

3. Global Warming and Acid Rain are caused the following ways:

Global Warming : Due to increase in carbon dioxide, Earth's atmosphere gets polluted. This increase in pollution leads to increase in Earth's average temperature. This is known as 'Global Warming'.

Three causes of global warming are as follows:

1. Greenhouse Gases: These gases trap heat, temperature of earth increases. Examples: Release of Carbon Dioxide by vehicles, factory and industrial processes.
2. Decomposition: Decomposition of organic materials releases Methane which is a greenhouse gas like Sulphur Dioxide, Nitrous Oxide, Chlorine and Bromine. These gases absorb heat radiations and cause warming of earth's surface.
3. Ozone Layer: It is caused by release of CFC gas used in industries and refrigerators. Ozone Layer prevents harmful sun-rays from reaching Earth. Ultraviolet rays enter Earth's atmosphere and are absorbed by greenhouse gases that increase global warming.

Acid Rain: Acid Rain is caused when carbon dioxide and Sulphur Dioxide gases mix with water vapour in the atmosphere. They react to form an acid and fall on the Earth along with rain. Acid Rain harms crops, forests, buildings and movements.

4. Three states of matter are as follows:

1. Solid
   - Particles are packed very close to one another.
   - They have definite shape and volume.
   - They do not flow.
   - They cannot be compressed.
   - Examples: Ice cubes, building, bed, book.
2. Liquid
   - Particles are not packed very close to one another.
   - They don't have definite shape, but have a definite volume.
   - They flow.
   - They cannot be compressed easily.
   - Examples: Milk, juice, soup, water.
3. Gas
   - Particles are packed very far away from one another.
   - They have neither definite shape nor definite volume.
   - They flow.
   - They can be compressed easily.
   - Examples: Oxygen, Carbon Dioxide.

5. Energy is the capacity of a body to do work. Energy is ability to do work. There are different forms of energy.

Three forms of energy are as follows:

lectrical Energy: Fans, washing machine, refrigerator and other electrical appliances work on electricity because electricity has energy. It is known as electrical energy.

Solar Energy : The energy that we get from sun is called Solar Energy. It is needed by plants, animals and human beings. Sun's heat dries wet clothes. A solar cooker uses sun's heat to cook food. Solar Geyser uses solar energy to heat water. Solar energy is used for producing electricity.

Wind Energy : The energy of moving air can be used for rotating a windmill. When a windmill rotates, its moves machines called Turbines which generate electricity. This energy is used for grinding grains, pumping water out of a well and for sailing a boat in water.

D. Write 'True' or 'False':

1. [False] 2. [True] 3. [True]
4. [True] 5. [True]

E. Match the following columns:

Column I		**Column II**
1. Mercury	(e)	Budh
2. Venus	(d)	Shukra
3. Mars	(c)	Mangal
4. Jupiter	(b)	Brihaspati
5. Saturn	(a)	Shani

F. Write any five ways to save water:

1. We should never wash fruits and vegetables with large amount of water.
2. We should try to take only short showers.
3. We should turn off the tap when not in use.
4. Don't leave the tap running while brushing our teeth.
5. Repair leakage in pipes.

G. Do it yourself.