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DISCOVERY Science

Teacher Manual

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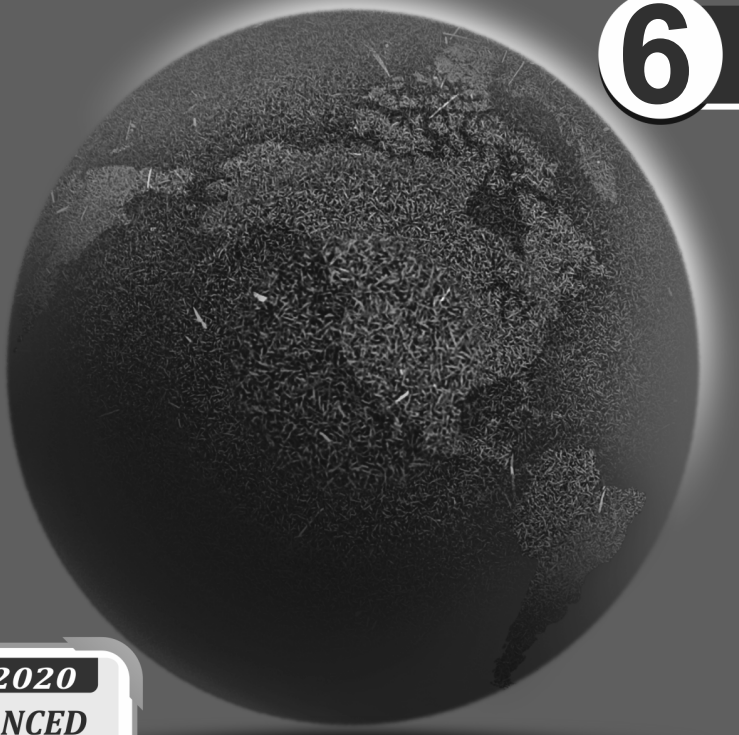

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CLASS - VI

CHAPTER 1
(Food and Its Sources)

Just Do More (Pg 5)

1. We need food for many purposes:
   - F Food provides energy.
   - F It helps in growth and development.
   - F It helps to overcome damages.
   - F It protects the body against diseases.
2. Sun is the main source of energy on earth.
3. The green leaves of the plant contains green pigment called chlorophyll.
4. The leaves synthesise food for the plant with the help of sunlight, CO_2 water and minerals. Since sunlight is called 'photo' the process of making food by plants is called photosynthesis.

EXERCISE

A 1. (a) proteins 2. (c) fish
3. (a) Carbohydrates 4. (a) money plant
5. (b) stem

B 1. True 2. False 3. False 4. True
5. True 6. True

C 1. Root 2. stem 3. flower 4. flower
5. fruit 6. seed

D 1. Plants prepare their own food for their survival. The mechanism in plants with which plants prepare their own food is known as photosynthesis.
2. Autotrophs are the organisms that prepare their food on their own through the process of photosynthesis. They are also called producers.
3. Spices are used in our food to improve taste and to add flavour to food.
4. Cod liver oil is obtained generally from the fishes found in seas. This oil is very rich in protein.
5. Beverages are also popular as common drink such as tea and coffee. But excessive use of tea or coffee is harmful for our

health. Tea is obtained from leaves while coffee is obtained from seeds.

E 1. Food is a substance which gives us energy to keep us healthy. All living beings need energy to carry out various life processes and to do many other activities. They get this energy from the food. Food acts as fuel for all living beings. It contains different types of nutrients. It helps in growth and repairs of worn out tissues. It protects our body from diseases.

We get food from both plants and animals. Thus, plants and animals product are our sources of food.

2. Non green plants do not prepare their food on their own. They get their nutrients after consuming other products. They are called consumers.

3. Cereals are the main sources of food because they fulfill most of our energy requirement. Some important cereals are rice, wheat, maize, sorghun, barley and millets (bajra). These are the main sources of energy, as they contain carbohydrates in large amount.

4. We need food for many purposes:
   - F Food provides energy.
   - F It helps in growth and development.
   - F It helps to overcome damages.
   - F It protects the body against diseases.

   Food contains vitamins and minerals that protect our body from various diseases and keeps our body fit and healthy.

5. Autotrophs are the organisms that prepare their food on their own through the process of photosynthesis. They are also called producers.

6. Water is needed by our body for good health. It works as means of transportation in our body. It carries various nutrients throughout the body. It also disposes off the wastes present in the body in the form of sweat and urine. It helps our body to absorb nutrients from food.

HOTS

1. Eating too much food is dangerous for health because it leads to obesity i.e., accumulation of a large amount of fat in human body.

2. Soaked seeds kept overnight in a wet cotton cloth. These sprouted seeds are very nutritious for health.

Let's Enjoy

Do yourself.

CHAPTER 2
(Food Habits and Safe Handling of Food)

Just Do More (Pg 14)

1. Rice 2. Rice 3. Wheat 4. Wheat
5. Rice

EXERCISE

A 1. (c) omnivores 2. (a) Wolf 3. (c) Yeast
4. (c) Round worm 5. (c) West Bengal

B 1. pressure cooker 2. rodents 3. herbivore, plants
4. herbivores 5. Omnivores 6. dead and decaying
7. wheat and pulses 8. Bihar

C 1. South region 2. Gujarat 3. Bihar 4. Punjab
5. West Region

D 1. (b) pisciculture 2. (d) poultry
3. (e) apiculture 4. (c) autotrophs
5. (a) heterotrophs

E 1. Organisms that feed on plants or plant products only are called herbivores. For eg. cows, buffaloes, deer etc.

Whereas animals that feed on the flesh of other animals are called carnivores.

2. People in our country eat different kinds of food. Their food habits depend on the availability of food, personal likes and dislikes and the production of food in that area.

3. Bihar, U.P., West Bengal, Odisha and Assam are also important states started in the eastern part of India. Rice and wheat are the main crops of Bihar and U.P. So, the people in these two states eat rice and as well as wheat. Rice is the main crop of West Bengal, Odisha and Assam. The people in these states like to eat rice and fish.

4. We can conserve food in the following ways:
   - F Cooked food should be kept covered.
   - F Food should be stored in clean containers.
   - F Food should be protected from rodents.
   - F We should cook food according to the number of people available to eat it.
   - F We should take food as much as we can finish.
   - F We should avoid over eating.
   - F Green vegetables, fruits and left over food should be stored in refrigerator.

5. Scavengers help to keep the environment clean because they mainly consume the dead bodies of other animals.

6. Geographical condition, taste of people and availability of food make some particular food items popular in particular regions.

F 1. We can take better advantage of various food by following given instructions:

- F Cereals should be cooked in an adequate amount of water.
- F Vegetables should be washed properly in running water before peeling and cutting.
- F Kitchen and utensils should be kept clean.
- F Food should be cooked on low flame.
- F Cereals and pulses should be cooked in pressure cooker.
- F Avoid over cooking, as it destroys important nutrients.

2. Food is very valuable and we must save it by following these instructions:

- F Cooked food should be kept covered.
- F Cereals and pulses should be stored in clean containers. The containers should be kept at a dry place.
- F Food should be protected from rodents, birds and insects.
- F We should cook food according to the number of people available to eat it.
- F We should take as much food as we can finish. We should not leave food in our plates after the meal.
- F We should avoid over eating because it may cause vomiting or it may lead to obesity.
- F Green vegetables, fruits and left over food should be stored in refrigerator.

3. On the basis of their feeding habits, animals can be classified into different groups:

Herbivores – Organisms that feed on plants or plant products only are called herbivores. Eg. cow.

Carnivores – Animals that feed on the flesh of other animals are called carnivores. Eg. lion.

Omnivores – Some animals eat both plants and other animals. They are called omnivores. Eg. dog.

Saprophytes– The organisms which derive their nutrition by feeding on dead and decaying organic matter are called saprophytes. Eg. bacteria.

Scavengers– Certain omnivores as well as carnivores mainly consume the dead bodies of other animals. Eg. crow.

4. People in our country eat different kinds of food. Some particular food items are popular in some particular regions.

Food in North Region : Wheat, rice, pulses, ghee, musturd oil etc.

Food in South Region : Rice, idli, sambhar, banana, dosa etc.

Food in East Region : Wheat, rice, fish etc.

Food in West Region : Rice, fish, wheat etc.

5. A number of small organisms derive food from the body of other organisms. They are called parasites. Some common parasites are round worms, tape worms, malarial parasites. A number of parasites reside inside our body but some of them are beneficial while some of them cause disease. All the parasites are responsible for the malfunctioning of the bodies of the host animals.
6. Herbivores have sharp teeth in front. So they can cut leaves. They have flat and grinding teeth at the back so that they can grind the food. For eg. cows, buffaloes etc.

   Whereas carnivores have sharp long teeth, which help in tearing the flesh. Carnivore birds have sharp and long beak for this purpose. Eg. lion, tiger etc.

HOTS

1. Since farmers work very hard in the fields to grow crops we should not spoil even a bit of food. Every bit is essential for us.
2. Animals that feed on the flesh of other animals are called carnivores. Whereas a number of small organisms derive food from the body of other organisms. They are called parasites.

Let's Enjoy

Do yourself.

CHAPTER 3
(Components of Food)

EXERCISE

A

1. (b) calcium
2. (c) Meat or Flesh
3. (a) dehydration
4. (c) honey
5. (c) Both (a) and (b)

B

1. proteins, vitamins
2. iron
3. Vitamin D
4. protein and mineral
5. 8-10
6. roughage
7. iodine
8. carbohydrates and fats

C

1. (e) Lack of RBCs
2. (d) Clotting of blood
3. (a) Carbohydrate food
4. (b) Vitamin C
5. (f) Butter
6. (c) Protein

D

1. The chemical substances which are present in our food and are necessary for the growth and functioning of body.
2. Diet that contains all the necessary nutrients in their proper ratio, as required by our body.

3. A disease which occurs due to lack of particular nutrients in our diet.
4. Fibres or roughage is the part of the food which cannot be digested and absorbed by the body.
5. Excessive body weight due to over eating and deposition of fat.

E. 1. Vitamins and minerals are needed by our body for proper functioning.
2. Carbohydrates and fats are important for our body as they are energy giving food.
3. To make new cells and replace old worn out cells, body needs lot of proteins. Therefore, protein are commonly known as building blocks of our body.
4. Vitamins are needed for normal functioning of our body. They are important for eyes, teeth, skin and even for proper functioning of our nervous system.
5. Diet that contains all the necessary nutrients in their proper ratio, as required by our body.
6. The symptoms of marasmus are:
   - F Child becomes extremely underweight.
   - F Muscle development is poor.
   - F Folds of skin can be seen.
   - F Child becomes so thin that the bones can be seen through skin.
   - F Legs become very thin and weak.

F 1. A growing child should take proteins in his diet. It helps in fighting diseases and infections. Children should take more proteins as their bodies grow and they need more body building food than any other age group.
2. Deficiency of proteins leads to malnutrition in children and they become very weak. This leads to disease like kwashiorkor and marasmus.
   (i) Kwashiorkor: This disease occurs due to severe deficiency of the proteins.
   - F The stomach of child gets protude.
   - F Legs become swollen.
   - F Dark and ugly patches on the skin.
   - F Discolouration of hair.
   - F Child's growth becomes retarded, he becomes under-weight.
   - F Aneamia.
   - F Mental Retardation.

   (ii) Marasmus: It is caused due to the deficiency of proteins, fats and carbohydrates.

- F Child becomes extremely underweight.
- F Muscle development is poor.
- F Folds of skin can be seen.
- F Child becomes so thin that the bones can be seen through skin.
- F Legs become very thin and weak.

3. It is caused due to lack of iodine in our diet. There is a gland called thyroid in our body which is situated in the neck region. It produces thyroxin hormone which controls the growth. Due to lack of iodine, thyroid swells up and production of thyroxin gets reduced. It reduces the physical and mental growth of the child.
4. (a) Deficiency of iron in body causes anaemia (problem in manufacturing of hemoglobin in R.B.C's)
   (b) Deficiency of calcium leads to hindered growth, brittle bones (Rickets), excessive bleeding.
   (c) Deficiency of sodium leads to cramps in muscles, dehydration and weakness.
   (d) Deficiency of potassium leads to weakness of muscles, which after some times result in paralysis.
5. Water works as means of transportation in our body. It carries various nutrients throughout the body. It also disposes off the waste present in the body in the form of sweat and urine. It help our body to absorb nutrients from food. It detoxifies the body and cleans the systems. It is also helpful in the digestion of food as it breaks the complex food molecules into simples ones. It maintains the temperature of the body and regulate it cellular functions, blood circulation etc. Fruits and vegetables contain a large amount of water. Therefore, water is called elixir of life.
6. Fibres are very important for our body as it cleans the body. Fibres passes throughout our digestive system but remain indigested. This removes all the unwanted materials from the system and ejects it in the form of stools. It helps in regulating the bowel movements and helps in curing indigestion and constipation. Fibre is eaten in form of vegetables, cereals, fruits, beans etc.

HOTS

1. Doctor advise elderly people to have calcium tablets because it keep our bones strong and prevent brittleness of bones.
2. ORS or Oral Rehydration Solution is given to person suffering from diarrhoea or vomiting as it rehydrates our body and maintain water and salt level in our body.

Let's Enjoy

A Do yourself.

B
1. Poor eye sight – (Vitamin A) Milk, carrots, cod-liver oil, green leafy vegetables
2. Anaemia – (Iron) Germinated grains, apples, eggs, green vegetables, turnip and yeast
3. Kwashiorkor – (Proteins) Nuts, milk, eggs, meat, fish and beans
4. Goitre – (Iodine) Eggs, fish, dairy products, cod liver oil
5. Scurvy – (Vitamin C) Green leafy vegetables, guavas, amla, citrus fruits
6. Rickets – (Vitamin D) Fish, meat, egg, cereals, dairy products

C Energy–giving – rice, wheat, milk, cereals, cheese, honey, oil

Body Building – pulses, fish, seafood, beans, meat

Protective– orange, lemon, groundnuts, turnip, peas, spinach, tomato, apple

CHAPTER 4
(Separation of Substances)

EXERCISE

A
1. (c) filtration
2. (b) alum
3. (a) winnowing
4. (a) Centrifugation

B
1. (c) threshing
2. (d) sedimentation
3. (b) filtration
4. (e) winnowing
5. (a) water filters

C
1. strainer
2. winnowing
3. Filtration
4. Filtration, distillation and sedimentation
5. sedimentation
6. Alum
7. handpicking
8. filtration

D
1. True
2. False
3. False
4. True
5. False

E
1. evaporation
2. constituents
3. thresher
4. winnowing
5. handpicking

F
1. Separation is required to remove harmful and unwanted substances from the mixture. For eg. stones in dal can harm our teeth or there can be stone in our vital organs like gall bladder or kidney. Husk particles can cause problem in our throat while swallowing it. So, cleaning and separating undesired objects is necessary.
2. The different ways through which threshing can be done are–

   F Manual way.

- F Getting the stalk crushed by feet of animals.
- F The third is the most effective method to get it done by machine called thresher.

3. In order to filter muddy water, we use filter paper to filter out mud from water. The mud is left on the filter paper while clear water gets collected in a glass below.
4. F Separation of pebbles and rice.
   - F Separation of stones and sand.
   - F Separation of coal and sand.
5. F Separation of tea and tea leaves.
   - F Separation of water and vegetables.
6. F Separation of coffee beans from coffee.
   - F Separation of muddy water to get pure water.

G

1. Winnowing is a method commonly practised by farmers to separate prices of chaff from the grain by wind or blowing air. Farmers throw the mixture of grains and husk from height in the direction of the wind. The grain being heavy drop vertically and form a heap on the other hand the husk being light in its weight is carried away by the wind at distance where it also gets collected in a form of heap. This is how winnowing is done.
2. The process by which two substances (an insoluble solid and liquid) are separated by passing the mixture through a filtering device is called filtration. In this process, filters are the medium of separation. The thickness of the holes of the filters depends upon the thickness of the solid matter to be filtered. This method of filtration is also used to get pure drinking water in our homes and in water processing and cleaning centres.
3. Insoluble substances which are heavier than water, settles down at the bottom of container. This process in called sedimentation. Chemicals like alum are used to increase the rate of sedimentation. The clear liquid is then gently poured off into another container without disturbing the sediment. This process is called decantation.
4. Sedimentation rate can be increased by using chemicals like alum during sedimentation.
5. The process by which two substances (an insoluble solid and liquid) are separated by passing the mixture through a filtering device is called filtration. In this process, filters are the medium of separation. The thickness of the holes of the filters depends upon the thickness of the solid matter to be filtered.

HOTS

1. We will separate sugar mixed with wheat flour with the method of sieving.

2. She does so to remove tea leaves from the tea before serving.

Let's Enjoy

1. Sieving 2. Threshing 3. Winnowing 4. Filtration
5. Present 6. Alum

CHAPTER 5
(Cloth Materials)

Just Do More (Pg 42)

1. Plants and animals.
2. Cotton, Jute, Hemp, Flax, Coir
3. The two conditions required for cotton plant are–
   - F Warm climate and temperature around 25°C.
   - F The rainfall should be moderate.

EXERCISE

A 1. (c) mulberry trees 2. (c) silk saree
3. (a) Britain 4. (c) Nylon 5. (b) Stem
6. (b) Absorbs water

B 1. 2000 2. Hargreaves 3. Black
4. warm and humid 5. linen 6. hemp plants

C 1. False 2. True 3. False 4. True
5. True 6. True

D 1. Seeds 2. Stem 3. Stem 4. Seed
5. Dry covering of coconut

E 1. We need clothes mainly to protect our body against weather, strong sunlight, extreme cold heat.

2. Weaving in the loom consist of interlacing one set of threads of yarn with another. The warp threads are stretched lengthwise in the weaving loom. The cross threads are woven into the warp to make the cloth.

3. In India, Maharashtra, Gujarat, Madhya Pradesh and Tamil Nadu are leading cotton producing states.

4. Firstly, cotton is collected and separated from the seeds in ginning factories. Cotton is then packed into big balls and sent to textile mills where it is cleaned and spun into threads called yarns. Finally, yarn is woven to make cloth fabrics.

5. The two uses of jute are–
   - F It is used for making rope.
   - F It is used for making carpets.

6. Clothes made from synthetic fibres are stronger and do not wrinkle easily.

F 1. About 30,000 years ago, people started using animal's skins for clothing. Archaeologists have found simple needles, made of animal's bones, which indicate that sewn leather and fur garments were worn by early man. It is believed that wool was first animal's fibre to be made into cloth. The fibre plant such as hemp and cotton came into use after the development of agriculture. The technique of weaving was devised about 2000 years old. The handlooms was devised about 2000 years ago and was brought to England by the Romans.

2. Modern mechanised textile manufacture was first developed in Britain. It was the result of spinning and weaving machines that were invented by Hargreaves. He invented spinning Jenny in 1765. The Industrial Revolution in England was a great factor in the development of modern machines which mechanised textile manufacturing.

3. Fibres that are obtained from plants are called plant fibres. The different types of plant fibres are:

Cotton

Cotton is soft fibre, that grows around the seeds of plant of cotton. It is obtained from a small annual shrub. Black soil is best suited for cotton plant.

Jute

It is fibre obtained from plant called patsun. It is second most important vegetable fibre. It is used for sacking. It is cheapest natural fibre.

Hemp

Hemp fibre is obtained from the stem of the hemp plant. It grows best in loamy soil. It is used in production of ropes, carpets etc.

Flax

It has been used to make fibre and cloth from ancient times. Fibres obtained from the stem of the flax plant are woven to make a fabric called linen.

Coir

It comes from the fibrous husk obtained from the dry covering of coconut. It is commercially very important, since coir is used for filling sofa seats and making coir foam matresses.

4. The fibres obtained from animals are called animal fibres.

Wool– It is one of the most important animal fibres. It is obtained from the hair on the body of sheep or goat. The process of removing hair from these animals is called shearing.

Silk– It is natural protein fibre obtained from a protective covering called cocoon made by silkworm around itself.

Beautiful silken cloth is manufactured with silk.

5. Clothes made from synthetic fibres are stronger and do not wrinkle easily. They also dry easily. But they have less air space in comparison to cotton. So, they are not airy. They cannot absorb sweat. Because of these reasons clothes made of synthetic fibres to make comfortable clothes which are airy and can absorb sweat.
6. The stem of the jute is stripped of leaves and are allowed to rot in water to release valuable fibres. It is loosely spun and woven to make sacks and bags of gunny cloth and for making carpets. It may also be used for rope making. Best soil for production of jute is alluvial soil. It is also grown in sandy loams and clay loams. Warm and humid climate is best for the production of jute. It grows best between 24°C- 37°C of temperature and 150 cm of annual rainfall.

HOTS

1. Polyester is widely used in manufacturing of various kinds of dress materials and curtains because it is durable and strong as compared to natural fibres.
2. This is because many layer of cotton clothes trap more amount of air in between them, as we know air is poor conductor of heat it do not allow the body heat to go outside and as a result it keeps us warm.

Let's Enjoy

A Do yourself. **B** Do yourself.

C Do yourself. **D** Do yourself.

CHAPTER 6
(Things and Materials)

Just Do More (Pg 51)

1. F Milk and water — Stone and metal
   F Air and kitchen gas — ✦ Wood and iron
   F Brick and notebook — ✦
2. Grouping of things into various classes based on similar properties.
3. Uses of classification are:
   F It saves a lot of time and energy.
   F It saves us from confusion.

Just Do More (Pg 53)

1. Various forms of matter-stone, clay, wood, glass etc. are considered as materials.
2. Sand and oil.
3. Wood, stone and clay.

EXERCISE

A 1. (b) containers 2. (c) metal
3. (b) Air 4. (a) solid 5. (a) Car

B 1. False 2. False 3. True 4. True
5. True

C 1. lustre 2. concrete and touched 3. Mass
4. time, energy 5. properties 6. gas 7. gas
8. Gas and liquid

D 1. (d) gas 2. (c) solid 3. (e) liquid
4. (b) amount of matter 5. (a) occupied place

E 1. A shine on the clean surface of any matter is called lustre.
2. Various forms of matter-stone, clay, wood, glass etc. are considered as materials.
3. Substances which dissolve in water are called soluble substances. Eg. sugar.
4. Materials has weight also. It is due to the mass they have.
5. Grouping of things into various classes based on similar properties.

F. 1. Classification of things is useful to us in the following ways:
- F Things can be placed in an orderly manner and they can be found very easily when needed out of their group only.
- F The things that are not useful can be discarded and new things can be added.
- F It saves us from confusion.
- F Classified things can be sub-classified also for further convenience.

2. A substance which is used in making different objects is called material. Articles of day to day use can be made from materials. Materials also fall into two major classes-naturally occurring materials and manmade materials.
3. Materials are different from each other in many ways. Some look different from each other. Some are hard like stone, wood, iron etc. They are called solids. Some are like water, milk, honey etc. They are called liquids. Still others are like air as the kitchen gas. They are called gases. All these different materials have different properties as well. Hard materials have definite shapes but liquids and gases takes up the shape of their container. They can flow as well as for that matter can be poured from one container to another. Among solids all metals have lustre except gold and copper which have yellowish lustre. All gases are non lustrous. Some materials are soluble and some are insoluble.

4. Materials have concrete shape and can be touched. As all solids have bodies, we can touch any solid stone, sugar, ice etc. and know whether it is hard, crumbly or smooth. We can touch any liquid and feel that it has a body. Water, milk, oil etc. all have bodies that can be touched.

   Materials has weight also. It is due to the mass they have. It is quite clear that materials may be different from one another, yet they have certain similarities. In other words, they are alike. They occupy space, have bodies and posses mass. Above all, they all are made up of matter.

5. All materials have different qualities. Hard materials (solid) have definite shapes but liquids and gases takes up the shapes of their containers. They can flow as well as for that matter can be poured from one container into another.

6. It is a property which is found in solids only. Those solids which after applying pressure on their surface, do not change their shape or do not get pressed are called hard. Maximum solids are hard and do not change their shape. Talcum made from soapstone is the softest substance while diamond is the hardest substance on this earth.

HOTS

1. Classification of things saves a lot of time and energy and also save us from confusion.

   For eg. If we visit a supermarket, we can observe things arranged in the shelves according to different categories. Keeping similar items on the same shelf help to find the required items immediately.

2. Cookers are made of metals and not plastic because metals are good conductor of heat and plastic is not.

Let's Enjoy

A Solids - wood, iron, copper, glass, plastic, clay, stone, steel
Liquids - milk, oil, honey, water, juice, soup, sauce, blood
Gases - oxygen, hydrogen, nitrogen, carbon dioxide, methane, LPG, CNG, helium
Materials - wood, glass, clay, iron, steel, cooper, clothes, gold

B Do yourself.

CHAPTER 7
(Matter: Nature and Properties)

Just Do More (Pg 58)

1. Different forms of matter are solid, liquid and gases.
2. Plate — circular
   Rod — cylindrical

Cube square

Just Do More (Pg 61)

1. Sugar, salt and glycerine.
2. A non conductor of electricity is called an insulator. For eg. plastic, rubber, wood, bakelite, clay etc.

EXERCISE

A 1. (a) Kanaad 2. (c) Stone
3. (b) solvent 4. (b) Aluminium
5. (b) Mercury

B. 1. True 2. False 3. True 4. False
5. False

C 1. different 2. made up of atoms
3. Transparency 4. grains 5. droplets 6. atoms

D 1. Mercury is used in thermometers because mercury is good conductor of heat and rises easily when comes in contact with heat.
2. As for solids, they diffuse very little because their particles are arranged in rigid patterns.
3. Ice floats on water but iron nail sinks because iron nail is heavier than water and ice cube is lighter than water.
4. Oil floats on water but glycerine disappears in it because glycerine is miscible i.e., soluble in water and oil is immiscible i.e., insoluble in water.
5. Electric wires are always covered with rubber or plastics because rubber is poor conductor of electricity and we do not catch current while touching them.

E 1. The different states of matter are solid, liquid and gases.
Solid – glass, wood
Liquid – water, oil
Gas – air, oxygen
2. The smallest particle of matter is called atom. For eg. a piece of iron is matter. The smallest piece of iron which cannot be broken away any further is said to be atom of iron.
3. If no light can pass through an object, it is said to be opaque.
Whereas if light can pass partially through an object, it is said to be translucent.
4. In case of electric bulb, current reaches the filament inside the bulb and heats it. The filament gets white hot and emit light around us.
5. Matter can be either soluble or insoluble in water. The liquids

soluble in water are called miscible, eg. glycerine and the liquids that are not soluble in water are called immiscible liquids eg. edible oil.

6. Transparency refers to feature of a material to let light pass through it.

F 1. Anything that occupies space and has mass is called matter. However, there are certain qualities which are common to all things that are considered to be matter.

- F All materials occupy space and has mass.
- F All materials can be touched.
- F All matters have mass. The amount of matter in an object is known as its mass.
- F It includes all substances of which the universe is made up of.

The smallest particle of matter is called atom. The bones and flesh of our body, the clothes we wear, the food we eat are all examples of matter.

2. The handles of frying pans are made of wood and plastic. These materials do not take up heat easily and it is easy to hold them when hot. In other words, wood and plastic are bad conductors of heat.

3. There are mainly three states of matter-solid, liquid and gases.

The states of matter can interchange. Most of the forms of matter can change from one state to another and also reverse back to their original forms. Water is a common example that explains this features of matter. Water, as a solid, is ice on melting ice becomes a liquid water. Vapour, on touching a cold surface, changes back to liquid form, water. This liquid water, when it is placed in a refrigerator, freezes into ice.

4. A liquid that allows other materials to dissolve in it is called solvent and the liquid containing a dissolved material is called solution. Water is universal solvent and it is also one of the primary basic needs of all living beings. Whereas, heaviness refers to the property of materials that allow them to sink or float on water. The things which are heavier than water sink in the water and those which are lighter than water float on the surface of water.

5. Diffusion means mixing of the particles of one material with the particles of another through natural movement, not by shaking or stirring.

Substance are classified into three groups, depending on the amount of light that can pass through an object. If light passes, it is known as transparent. If no light can pass through, it is called

opaque. If light can pass through partially it is called translucent.

Conductivity means behaviour of the matter and its forms towards heat, electricity and magnetic force.

6. Things which are heavier than water, sink in it and those which are lighter than water float on the surface of water. Substances like wax, wood, oils, ice, plastics etc. float on water due to their lesser density than water. This is the reason why a big ship made of wood can float on the sea but a small nail of iron will sink in it.

HOTS

1. We use fuse in electric circuit so that at the time of short circuiting fuse breaks the connection and prevents further occurrence of disaster.
2. Water has higher density than ice because ice floats on water and do not sink.

Let's Enjoy

A Do yourself.

B Do yourself.

CHAPTER 8
(How Things Change)

A 1. (a) applying force 2. (a) irreversible change
3. (a) slow chemical change 4. (b) reversible change

B 1. (d) are irreversible changes 2. (c) is a chemical change
3. (a) is a change in its state 4. (f) solvent
5. (e) formation of clouds 6. (b) is a physical change

C 1. irreversible 2. condensation
3. lighter 4. expands 5. evaporates

D 1. Physical Change – Those changes which are temporary and no new substances are formed.
2. Evaporation – The process of turning liquid into its vapour state is called evaporation.
3. Condensation –Cooling down of vapour is called condensation.
4. Reversible Change – A change by which a matter can be brought back to its original shape, state, size, colour or form.
5. Change in State – Matter can change from one state to another if heated or cooled. This is called as change in state of matter.
6. Irreversible Change – A change which cannot be reversed back.

E 1. A change by which a matter can be brought back to its original shape, state, size, colour or form is known as reversible change.

Whereas a change which cannot be reversed back is knows as irreversible change.

2. We will keep the mattress in sunlight so that the cotton become soft and fluffy again.

3. (a) irreversible (b) irreversible
(c) irreversible (d) irreversible
(e) reversible (f) irreversible
(g) reversible (h) reversible
(i) irreversible (j) reversible
(k) irreversible (l) reversible

4. F Drying of clothes.
F Water changing into water vapour.
F Drying of wet floor.
F Drying of water bodies in hot climate.

F 1. If we heat water, it will become vapour, thus taking gaseous form. If ice is heated it becomes water. Similarly, water when freezes turns into solid ice. Water expands on heating. Take a glass filled with water into a container and heat it. Now, try to pour the water back into the same glass. The water overflows.

2. The property that wax melts on heating allows the wick to carry wax as a fuel for burning candle. Also, when we stop heating the wax freezes and takes its shape. This is why wax is used for making candles.

3. The process of evaporation and condensation is the basic principle of formation of clouds and rains. When the temperature of the earth rises the water from seas and rivers start evaporating in the environment. At the upper levels of environment they get condensed in the form of clouds and cause rain on earth. This cycle keeps on going, causing rain on earth.

4. A substance breaks and dissolves in water and this property of the substance is called solubility. The water is the solvent which dissolves all the solute (sugar) in it. The solubility of a given solute in a given solvent typically depends on temperature. Water when heated dissolves more sugar as compared to cold water. This is because the solution reaches saturated state later while heating as compared to cooled solution.

HOTS

Tearing a paper is not a chemical change as no new products are formed. Rather, it is a physical change which is irreversible in nature. You cannot join the pieces of paper to make the page which was earlier.

Let's Enjoy

1. Reversible 2. Chemical 3. Solute 4. Expand
5. Irreversible

CHAPTER 9
(Things Around Us)
EXERCISE

A 1. (a) Air 2. (c) Amoeba 3. (b) Cells
4. (c) Both (a) and (b) 5. (c) during day and night
6. (b) Energy

B 1. Microscope 2. cellular 3. excretion 4. reproduction
5. Multicellular 6. Birds 7. cell
8. unicellular organism

C 1. (d) life span 2. (e) excretion
3. (c) cell 4. (a) multicellular
5. (b) plants

D

1.	Plants,	Dog,	Human Being
2.	Table,	Pen,	Car
3.	Lion,	Cow,	Giraffe
4.	Amoeba,	Parcamecium,	Yeast
5.	Bear,	Elephant,	Human Being

E. 1. Plants grow throughout their lives.

2. A microscope is an instrument which magnifies small objects to look bigger. A microscope contains two or more than two lenses.

3. In air, oxygen is emitted by the plants, because they take carbon dioxide from the atmosphere, which is breathed out by the animals and give out the oxygen required by animals.

4. The process by which living things utilise the oxygen to release energy stored in the food they eat is called respiration.

5. Mimosa – or touch me not, immediately curls its leaves as a response to the stimulus of touching the plant.

F. 1. The characteristics of living being are:

- The basic unit of the structure of plants and animals is cell: living things have a definite structural organisation. Their bodies are made up of cell, which are building blocks of body. A cell is basic unit of life.
- Living things grow– Growth in living things is irreversible. We cannot get the seedling back from the tree.
- Reproduction– Another characteristic feature of living beings is the production of offspring just like them. This process is called reproduction.
- Living things need food– Food is required by all the living things to grow and do other activities.
- Respiration– The process by which living things utilise the

oxygen to release energy stored in food they eat is called respiration.

- Excretion of waste by living beings– Living things remove waste from their body through excretion.
- Living things can move– All living things show movement in one form or another.
- Response to stimulus– A change in the immediate environment of an organism, produces change in activities of organism is called stimulus. An organism's reaction to a stimulus is called response.
- Life Span– Each living being has to die one day. Every living things have different life span.

2. All living and non living things are made up of matter. Thus, they have mass and they need space. Second, common feature is their structural unit. Both of them have a basic structural unit with which they are constituted. The basic structural unit of non living things is molecule and the structural unit of living thing is cell. Cell varies in their shapes and sizes.
3. Without abiotic factors no living being can survive.
   - Air – Air is an essential part of our lives. Air is present around us in the form of thick layer called atmosphere. We take oxygen from air and throw carbon dioxide. Plants breathe in this CO_2 and exhale oxygen for animals and in this way balance of O_2 and CO_2 is maintained in nature. Air also maintains the temperature of the earth.
   - Water – 70% of earth's surface is water. Water is used for many purposes. It is essential for all living organism. Aquatic animals have confined their lives in water.
   - Soil – Soil is like mother to all terrestrial plants and trees. Without soil no plantation can exist on the earth. Soil holds the plant and all the nutrients. Soil is home to many small organisms like rabbit, rats etc.
   - Temperature – The heat in our environment is called temperature. Heat on the earth is due to the heat sent by the sun. The temperature on earth varies.
   - Light – We get natural light from sun. It keeps the earth well lit. No sunlight means no plant and no plants means no life.
4. The body automatically moves backward when it touches something hot. So, a change in the immediate environment of an organism which produces a change in the activities of organism, is called stimulus. An organism reaction to stimulus is called response. Mimosa or touch me not, immediately curls its leaves as a response to the stimulus of touching the plants.

5. In air, oxygen is emitted by plants and CO_2 is taken in. On the other hand human beings and animals take in O_2 and release CO_2 in air. Thus, the cycle of respiration goes on in biotic components. Aquatic animals breathe the O_2 dissolved in water and release CO_2 which is taken up by aquatic plants.

   Biotic components also depend on each other for food. For eg. cow eats grass and then cow is eaten by lion. This is how biotic components are interlinked.

6. The production of offspring just like parent is called reproduction. Birds normally reproduce by laying eggs from which a baby bird comes out. The birds sit on the egg to give warmth to it. After a few days the baby bird comes out of the hatched egg. In case of plants, they are produced from the seeds. Animals usually do not lay eggs. They give birth to their babies directly.

7. Plants and animals respire all the time. In the absence of O_2 all animals would die. We get this oxygen from air. In air oxygen is emitted by the plants, because they take CO_2 from the atmosphere, which is breathed out by the atmosphere, which is breathed out by the animals and give out the oxygen required by the animals. Thus, the cycle of respiration goes on.

HOTS

1. Plants are called nature's air conditioners because they purify the air by absorbing carbon dioxide and releasing oxygen during photosynthesis. The presence of CO_2 increase the temperature of atmosphere. All plants give out in excess water during transpiration in form of water vapour.
2. Yes, because more human population means more need of O_2 and more release of CO_2 in air. This requires more plants for maintaining the ecological balance in nature. Or else, there would be competition to survive in world.

Let's Enjoy

A Do yourself.

B Do yourself.

C Do yourself.

CHAPTER 10
(The Habitat of the Living Organisms)

Just Do More (Pg 84)

1. Organic matter, living organism and fish.
2. Air, water and sunlight.

3. Plants are called producers because they prepare their own food and do not depend on others for their food.
4. Virus, fungus and bacteria.

Just Do More (Pg 86)

1. True 2. True 3. True 4. True

Just Do More (Pg 87)

1. Plants growing in water are called hydrophytes.
2. Pistia, Lemna.
3. Yes, roots of lotus are fixed in mud.
4. Water plants have waxy coat on their leaves so that they do not sink, wrinkle or destroy.

Just Do More (Pg 87)

1. Mango, peepal and sunflower.
2. Since, terrestrial plants have to take in water and other nutrients from soil they have well developed roots with root hair. Root also help them to stay erect on the land.
3. The leaves of mesophytes are large, broad and thin. They generally live horizontally to get maximum sunlight for photosynthesis.

Just Do More (Pg 89)

1. Aquatic animals have streamlined body so that it reduces resistance of water and help them swim fast.
2. Gills used dissolved oxygen in water and fins maintain the balance and help in movement through water.
3. The head of aquatic animals is in a conical shape that makes an easy passage in water.

Just Do More (Pg 91)

1. Beaks of birds are used to catch insects, clean feather and make nests.
2. Fore limbs of birds are modified into wings for flying in the air.
3. Because birds lack teeth, their bills have evolved to perform feeding activities.

EXERCISE

A 1. (a) hydrocoles 2. (a) Polar Bear
3. (c) Earthworm 4. (b) Mango
5. (b) Hydrilla 6. (a) Aquatic

B 1. moist and shady 2. water
3. stems 4. leaves, reduced
5. appendages 6. Amphibians
7. thick 8. fur

C 1. (f) Sunlight 2. (d) Pistia

3. (g) Lotus 4. (a) Chara
5. (b) Xerophyte 6. (h) Hydrocoles
7. (c) Transparent eyelids 8. (e) Birds

D 1. False 2. True 3. False 4. True
5. True 6. True 7. False 8. True

E 1. Camels have a capacity to store water in their body for several days. It can drink a very large quantity of water at a time, when stay without water for long time. They have thick skin to cope with excessive heat and temperature. They have padded feet which help them to walk on desert. Their body temperature changes with atmospheric temperature, thus reduces the loss of moisture.

2. Lotus have roots fixed in mud. But they have long petioles in their leaves that keep them floating. These plants are soft and weak which reduce the weight of the plant and help them in floating.

3. The frog's front pair of legs is short and the back pair is long. Its feet are webbed and helps the frog to swim in water. The two pairs of legs help them to jump with ease. Frogs have a sticky tongues and insects get stuck in it.

4. They have spines instead of leaves so that the rate of transpiration is reduced and they can retain water in them even in harsh climatic conditions.

5. Polar bear have thick skin or fur to protect themselves from cold. Some animals like polar bear have strong limbs for running up the rocky and cold slopes of the mountains.

F 1. Plants interact with abiotic components like air, water, sunlight and minerals to prepare their own food by the process of photosynthesis. Some organisms depend directly or indirectly on the food prepared by plants. These also need oxygen and water for their survival, hence they also depend on abiotic components. In this way all the biotic components depend on abiotic components for their survival.

2. Habitat is the special environment of an organism in which it lives and grows. Habitat offers food, shelter and suitable climatic conditions to an organism in order to make it breed, flourish and survive. Every animal has different requirement for their survival therefore habitat of organism differs. Different species of organism have different kind of needs. They live in a place where they can fulfill all their needs.

3. A habitat is a place where an organism lives must provide the suitable food, shelter and climatic conditions so that it can easily

survive breed and flourish. Different kinds of biotic and abiotic components are found in different habitats. Different species of organism have different kind of needs. They live in the place where they can fulfill all their needs.

4. F Due to availability of plenty of water, the roots in water plants are less significant. So, either those plants have no roots or have very poorly developed roots.
   F The stems are long and narrow, to with stand water currents without getting damaged. Stems have airy space to enable the plant float.
5. Since, plants are the only living beings that convert solar energy into the form of food, that's why they are also called producers.
6. The streamline shape reduces resistence due to water and helps them swim fast in water.

C 1. F Since terrestrial plants have to take in water and other nutrients from the soil, they have well developed roots with root hair. Roots also help them to stay erect on the land.
   F Stems have well developed mechanical and vascular tissues. They are solid and freely branched.
2. Leaves of most of the xerophytes are highly reduced and sometimes absent. For example, in opuntia the leaves are modified into long slender spines and in Australian. Acacia, the leaf petiole behaves like a leaf. This feature of the xerophytes prevent water loss from the plants.
3. A halophyte is a plant that naturally grows where there is salinity in the root area, such as in saline semi-deserts, mangrove swamps, marshes and sloughs and seahorses.

   Adaptive Features of Halophytes:

   F Halophytes have branched roots which come out only from the soil surface to allow air to enter the soil.
   F They have green small and leathery leaves which also have water storage tissues.
4. Fishes have streamlined body. This shape reduces resistance due to water and helps them swim fast in water.
   F Fishes have gills for respiration. Gills use dissolved oxygen in water.
   F Fishes have special appendages called fins.
   F These maintain the balance of their body and help in movement through water.
   F They have air filled organs and swim bladder. They maintain buoyancy which also help in swimming and respiration.

F The body of aquatic animals is covered with scales which protects them from decaying.

F The head of fish is in a conical shape that makes an easy passage in water.

5. F Most of the desert animals are burrowing and nocturnal. It protects them against the scorching sun and prevents excess water loss.

F The nostrils are reduced to pin holes or are protected with due valves that protects them from sand.

6. F Fore limbs of birds are modified into wings for flying in the air.

F Birds have beaks which are used to catch insects, clean feather and to make nests.

7. F Plants prepare their own food and some organism depend directly or indirectly on the food prepared by plants. In return animal provides them with waste products, which is rich in various nutrients.

F Plants gives oxygen to animals and animals in return give CO_2 to plants for respiration.

8. F The stems of hydrophytes are long and narrow, to withstand water currents without getting damaged. Stems have airy space to enable the plant float.

Whereas stems of xerophytes are fleshy with water storage tissues as water is scarce in deserts.

F Due to availability of water hydrophytes roots are less significant. So, either these plants have no roots or have very poorly developed roots. Whereas roots of xerophytes are very long. They grow as deep as possible in search of water. For example, a xerophyte, alfafa, has roots which may be more than 30 m long.

HOTS

1. The leaves of mesophytes are large, broad and thin. They generally live horizontally to get maximum sunlight for photosynthesis.
2. We keep ourselves covered with proper clothing and use heating systems for maintaining temperature in our houses.

Let's Enjoy

A Do yourself.

B Do yourself.

CHAPTER 11
(Different Parts and their Functions in Plants)
EXERCISE

A 1. (a) Marigold 2. (c) Wheat 3. (c) petiole
4. (b) pedicel 5. (c) Ovary

B 1. (f) Roots 2. (d) Stamens 3. (e) Ovaries of the plants
4. (a) Stem 5. (b) Tendrils 6. (c) Pitcher plant

C 1. spreads, maize and wheat 2. banyan, sugarcane
3. stem, outer skin 4. spines
5. roots 6. seedling, plant 7. fruit

D 1. **Root**

- F They modify themselves to store food and nutrients in them.
- F They hold the soil together and prevent soil erosion.
- F Roots fix the plant firmly in the soil.
- F Roots provide the plant necessary nutrients and water for its growth.
- F Roots absorb water and nutrients from soil and send them to the leaves for manufacturing of food.

2. **Stem**

- F Stem holds the plant straight above the soil
- F It bears other parts of plant like fruits, branches, flowers, leaves etc.
- F It transport the water taken from root to different parts of the plant through small fibres likes tubes present inside them.

3. **Leaf**

- F The main function of the leaf is to make food for plant. It undergoes the process called photosynthesis to prepare the food.
- F Plants remove the extra amount of water through tiny pores present on the surface of leaves called stomata.
- F Leaves help plants to breathe.

4. **Petals**

Petals are modified leaves that surround the reproductive parts of flowers. They are often brightly coloured to attract pollinators.

5. **Flower**

The primary function of flower is reproduction in a plant.

E 1. The parts of plant that remain under the ground form the root system and the parts of the plant that remain above the ground form the shoot system.

2. A leaf modifies itself into thorns in desert plants to avoid evaporation of water from plant.

   In climbers, the leaves modify themselves into tendrils like that of stem. These tendril help them in climbing. Eg. sweet pea. Leaves modify themselves to store the food as in onion.

   In insectivorous plants leaf modifies itself to trap the insects. Eg. pitcher plants.

3. F The main function of the leaf is to make the food for the plant it undergoes the process called photosynthesis to prepare the food. It has a green pigment called chlorophyll, which traps the sunlight and with the help of water, CO_2 and sunlight the leaf prepares the food in the form of sugar and releases O_2 in this process.

   F Plants remove the extra water through tiny pores present on the surface of leaf called stomata.

   F Leaves help plant to breathe. Leaves of most plant have tiny openings called stomata. The exchange of gases takes place through stomata.

4. Those plants which have competitively weak stem grow modifications called stem tendrils. These tendrils are like coil and are modifications of stem for extra support. These tendrils can curl around any solid support on their way. Eg. Tendrils in grapevine, gourds, passion flower.

5. For extra support small roots start shooting out form the stems to provide extra support to the plant. Similarly, banyan tree also have prop roots coming down from the branches, fixing themselves in the soil and giving support to the tree.

F. 1. Flower is the organ of reproduction in plants and it grows into the fruit which beans seeds. A typical flower possesses male and female reproductive organ. Every flower has a stalk called pedicel. But some flower lack pedicel and such flowers are sessile. The outermost whorl or set of flower is composed of green leaf like protective structures called sepals. These protect the flower in the bud condition. Stamens are next to petals and consist of anthers and filaments. Anthers are swollen structures present on tip of filament. The anthers produce a powdery substance called the pollen grains. The stamens represent the male part of a flower. The central part of the flower is the female part consisting of a floral shaped organ, called the pistil. Each carpel consist of a basal swollen part called the basic swollen part called the ovary. The ovary continues into a long style and ends in an knob like part, called the stigma. The ovary contains small, bead like structures called ovules. Female sex cell is present

inside the ovule. Ovules and ovary finally develop into seeds and fruits respectively.

2. Roots can be of two types:

   Tap Root System – In this system there is a main root which goes deep inside the soil and have some small roots branching out of the main root to give extra support. For eg. tulsi, mustard etc. Tap roots are also called tree roots.

   Fibrous Root System – In this system there is no main roots. A number of fine and long roots, shoot out of the base of the stem and spread out in the earth. This gives support to the plant. For eg. maize, wheat etc.

3. Roots of the plants according to their requirements perform extra functions also.

   (i) Storage modifications: We eat radish, carrot, turnip because there is food stored in them in the roots. The food made in the green leaves travels downward and is stored in these tap roots. Plants use this food when conditions are not favourable.

   (ii) Modification for support: Roots grow to provide extra support to plant as prop roots form the branches, fixing themselves in the soil and giving the support to the tree.

4. Do yourself.

5. A cactus plant grows in desert where there is very little water. To prevent loss of water from the surface, leaves of cactus are modified to become spines. It is the green stem in the cactus that performs all the functions performed by leaves in other plants, including the preparation of food. The stem is fleshy and can store water for long period.

6. **Storage modifications:** Stems like potatoes, ginger, onion etc. store the food in them and become tubular in shape and get underground. The marks on potatoes are the dormant buds.

   Modification for support: Those plants which have competitively weak stem grow modification called stem tendrils. These tendrils are like coil and are modifications of stem for extra support. These tendrils can curl around any solid support their way. Eg. tendrils in grapevine, gourds and passion flowers.

   Modification to prepare food: A cactus plant grows in desert where there is very little water. To prevent loss of water from the surface of the leaves these are modified to become spines. It is green stem in the cactus that performs all the functions performed by the leaves in other plants, including the

preparation of food. The stem is fleshy and can store water for long periods.

HOTS

1. The leaves often have broad and flat surface to absorb more sunlight for the process of photosynthesis. Also, for regulating process of transpiration.
2. Some flowers are brightly coloured and have a sweet smell to attract insects for pollination.

Let's Enjoy

A Do yourself. **B** Do yourself. **C** Do yourself.

Chapter 12
(Different Organs and their Functions in Animals)
EXERCISE

A 1. (c) Skull 2. (b) hinge joint 3. (c) gliding point
4. (b) Cockroach

B 1. (b) bones and cartilages 2. (d) exoskeleton
3. (e) endoskeleton 4. (a) pseudopodia
5. (c) cilia

C 1. ball and socket
2. hinge, ball and socket, pivot, gliding
3. Vertebral column 4. Pivot, gliding
5. tongue, food pipe, stomach, small intestine, large intestine and anus
6. nervous
7. reproductive 8. digestion and absorption
9. ligaments 10. liquid

D 1. Nervous system, digestive system, respiratory system and excretory system.
2. (a) Heart, lungs, part of stomach and kidney.
   (b) Brain (c) Spinal cord
3. On the basis of movements we can classify the joints as:
   - Pivot joints
   - Gliding joint
   - Ball and socket joint
   - Hinge joints
4. Earthworms have liquid in place of bones in their body. The muscles in their body squeeze against the liquid to make a movement.

5. Fish move with the help of muscles present along with their backbone. While moving, they contract the muscles on one side and relax the muscles on other side. Movements of fins and tails also help in finding way in the water.
6. X-ray is the photograph of the bones of our body. With the help of x-ray we can find out any defect in our bones.

E 1. The human skeleton is made up of 206 bones. It performs the following functions:
   1. It helps in movement of various body parts.
   2. It provides shape and support to the body.
   3. It protects the soft internal organs. Bones are filled with a substance called marrow, which produces blood cells.
2. Bones are filled with a substance called bone marrow. This helps in producing blood cells. They are soft and spongy tissues.
3. The movement in bones is due to the muscles attached to them. Bones are not capable of moving on their own. It is the muscles that pull and push our limbs. Muscles attach to our arms contract when we want to raise it and they relax when we bring it back. So, movement in ribs during breathing, in vertebral while bending and twisting, in jaws while chewing and in legs while walking, running, jumping is all due to the muscles attached to bones of these respective body parts. When these muscles get weak or are torn due to over stressing, the movement of that parts of body gets hindered.
4. Joints are places where two or more bones meet. There are four different types of joints in our body.

   Hinge joint – The joints which allow up and down movement are called hinge joints. For eg. elbow, knee and finger joints.

   Ball and socket joints – In this type of joint, the ball of one bone is fitted in the socket of another bone. The ball can move inside the socket. This type of joint is found in hips and shoulder.

   Pivot joint – In these types of joint the conical or rounded ending of one bone, fits into a grove of similar space of other bone. The joint of the neck is an example of pivot joint. This joint also allow movement in all directions.

   Gliding joints – In these type of joint the flattened ends of small bones are joined with each other. These types of joints allow side movement as well as up and down movement. Joints in wrist, ankles and vertebrae are of these type.
5. The skeletal system in other animals can be mainly of three types.

   Endoskeleton – Some animals have their skeletal system

enclosed inside their bodies. Such skeletal systems are called endoskeletal system. These are found in humans, fish, amphibians, birds, mammals and reptiles. Their speciality is that they all have the vertebral column.

Exoskeleton – Some animals have skeleton outside their body. Such skeletons are called exoskeleton. Such skeletons exist in snail, cockroaches, crabs and other insects. It gives protection and movement to their bodies.

Liquid skeleton – Some organism have liquids in place of bones in their bodies. This liquid helps them in movement. All worms have liquid skeleton.

HOTS

1. We cannot move elbow backward because we have hinge joint in elbow which only allows up and down movements.
2. No, because there would be no flexibility in our body.

Let's Enjoy

A Do yourself. **B** Do yourself.

CHAPTER 13
(Motion and Measuring Distances)
EXERCISE

A 1. (a) measurement 2. (b) translatory motion
3. (a) linear motion

B 1. (c) Rotatory motion 2. (a) Curvilinear motion
3. (e) Non-periodic motion 4. (b) Periodic motion
5. (d) Rest

C 1. True 2. True 3. False 4. False
5. True

D 1. SI units 2. vibratory motion 3. rotatory motion
4. Rotatory motion and non periodic 5. Metre

E 1. People of prehistoric times moved around on foot. They also had no way to tell how far they had travelled. After they learnt to keep animals they started using the domesticated animals as their mode of transportation. Eg. cow, horse, donkey, oxen etc.

2. After the invention of wheel, their motion became easy. They started using carts and carriages, driven by their domestic animals slowly, men invented all these modern means of transportation.

3. Standard units are those that have a fixed value and therefore, do not vary from person to person and place to place. These units are

the international system of units refered as SI units. SI units of length is meter (m).

4. To measure the length of straight object a ruler can be used. Place the ruler, along the length of object, coincide the zero marked on the ruler with the end point at one side of the object, reading of the ruler coinciding with other end of object gives length of the object in centimeter.
5. We will measure the height of a person with help of wall mounted ruler.

F

1. It is not possible to measure the length of a curved line directly using a metre scale. We make use of a piece of thread or a divider from a geometry box to measure the length of a curved line.
2. S.I. unit of length is metre (m). Multiples and submultiples are used to make large and smaller measurements. The French originated the metre air. The metre rod is realistically represented by the distance between two marks on an iron bar kept in Paris.
3. When an object moves as a whole, that is, if all its parts move the same distance in a given time, it is said to be in translatory motion.

   Whereas rotatory motion is that in which a body moves about a fixed axis without changing its position.
4. The precautions that should be kept in mind while measuring the length:
   - F Always uses a fully marked ruler. Worn out sides of the ruler should not be used.
   - F Keep the ruler exactly along the length of the object to be measured.
   - F Reading should be taken from the vertical point i.e., your eye should be vertically above the point to be measured.

HOTS

1. Yes, because there is a vibratory motion in the tectonic plants during earthquake.
2. Me and my friend while returning home in a school bus are at motion.

Let's Enjoy

A Do yourself. **B** Do yourself. **C** Do yourself.

CHAPTER 14
(Electric Current and Circuits)

Just Do More (Pg 127)

1. Electricity is a form of energy which is transportable and can be controlled.

2. Air conditioner, television, refrigerator, mobile phones, mixers, iron etc.
3. George Lechalanche made an improved version of voltaic cell called dry cell.

EXERCISE

A 1. (a) Argon 2. (a) Copper 3. (c) Volta 4. (c) Copper
5. (a) Wood

B 1. False 2. False 3. True 4. True
5. True 6. True

C 1. current 2. Coulomb 3. key 4. battery
5. good

D 1. The electricity produced by rubbing upon one body with another is called static electricity whereas the changes that travel along wires is electricity and its motion is called current electricity.
2. The voltaic cell was developed by a great scientist called volta in around 1800 AD. It has two rods of zinc and copper placed in a solution. When these two rods are connected with a metal wire, the electric current starts flowing.
3. The dry cell contains a paste of ammonium chloride inside zinc container. In the centre, a carbon rod is fitted with a metal cap. Wrapped in a muslin cloth bag which contains a mixture of powdered coke, graphite, zinc chloride and manganese dioxide. The cell is completely sealed from the top. The zinc can is also wrapped so that only base is exposed.
4. The sources of electric current are battery, cell, voltaic cell, dry cell.
5. Copper.

E 1. Some materials allow electric current to pass through them, others do not. The materials that allow electric current to pass through them are called conductors. Eg. copper, silver etc.

   Whereas the materials through which it is difficult for the electric current to flow are called insulators. Eg. rubber, plastic, wood etc.
2. One or more cells are used to power the torch. There is also a circuit inside the torch through which current is passed. A torch also consist of a switch and a small bulb. The switch of the torch allows current to pass through the circuit when it is pressed. When current passes through the circuit the bulb glows.
3. If the wire in the circuit gets detached then the flow of current will stop in the circuit.
4. A switch or a key which regulates the flow of current in a circuit. It allows the current to flow through the circuit when it is open

and prevents the current from flowing through the circuit when it is closed.

5. Do yourself.
6. Insulators are used to cover metallic wires being used in our homes because insulator avoid electric shocks.

HOTS

1. We should wear rubber slippers while working with electricity because rubber is an insulator of electricity and prevents from electric shock.
2. If we did not have an electric switch we would not be able to control the flow of current in a circuit.

Let's Enjoy

A Do yourself. **B** Do yourself.

C
A - Q - Z
B - R - W
C - S - X
D - P - Y

CHAPTER 15
(Fun with Magnets)
EXERCISE

A 1. (c) Iron 2. (c) Gold 3. (c) Steel
4. (c) weak magnets 5. (c) Nickel

B 1. True 2. True 3. False 4. False
5. False 6. False

C 1. (d) natural magnet 2. (c) magnetic compass
3. (e) pairs 4. (b) magnet
5. (a) non-magnetic substances

D 1. North South 2. geographic north
3. North 4. repel 5. Unlike poles 6. Compass

E 1. Compass and ATM Cards. 2. Compass.
3. Magnet has two poles North and South.
4. The substances which get attracted towards a magnet is called magnetic substance. The substances which do not get attracted towards a magnet are known as non magnetic substances.
5. No, the copper is not magnetic. So, the strong magnet will not attract copper.

F 1. Magnetite ($Fe_3 O_4$) is the only natural form of magnet. It can attract the iron towards itself. It also has directive property of pointing towards north to south direction when suspended.

So, we can say that substance which attracts iron towards itself is called a magnet and this property of attracting iron is called magnetism.

2. Take two magnets one bar magnet and one suspended magnet, bring them in contact with each other from the north pole. The north pole of the suspended magnet gets repelled. Repeat this activity again. You will observe that the same pole repel each other.
3. If a bar magnet is broken into two parts it will give rise to two magnets and so on but we will never get the poles of the magnet isolated.
4. Magnetic compass is used by sailors and navigators to know the northern and southern, eastern and western directions. In this compass, the needle which is free to rotate, always rest in the North South direction.
5. Some uses of magnet are:

(i) Magnets are used in audio, video tapes and computer hard disk to store information.

(ii) The information is stored in a magnetic chip in credit cards and ATM cards.

(iii) Used for picking up iron pieces from waste.

(iv) Used in refrigerator door stickers, closing mechanism of refrigerator door, bulletin boards and toys.

(v) Used in electric motors, like that of fans, bicycle automobiles, dynamos for making electricity.

(vi) Used in speakers, microphones, picture tubes of televisions and computer monitors.

HOTS

1. A compass is available both at day and night whereas the stars can only be seen at night or when it is dark on a cloudier sky.
2. West would be the direction that is perpendicular and to the left of the North pole of the bar magnet.

Let's Enjoy

A Do yourself.

B 1. North 2. repel 3. attract 4. magnet 5. South

C 1. Attract 2. Repel 3. Repel 4. Attract

CHAPTER 16
(Rain, Thunder and Lightning)
EXERCISE

A 1. (c) ground water 2. (c) rain
3. (c) freezes 4. (a) solid
5. (b) electrical discharge 6. (c) Both (a) and (b)

B 1. water cycle 2. solid, liquid, gas
3. freezing 4. condensation
5. electricity 6. freezing point

C 1. True 2. True 3. True 4. True
5. True 6. True

D 1. The three states of water are solid, liquid and gaseous states.

Solid	-	Ice
Liquid	-	Water
Gaseous	-	Steam

2. Water from the seas, oceans, rivers, ponds etc. gets evaporated due to the heat of the sun. This water goes to the atmosphere by evaporation and it gets condensed in the form of clouds, due to lesser temperature of the upper layers of the atmosphere. When clouds have more than sufficient drops in them, the drops starts falling on the earth in the form of rain.
3. Sometimes the water droplets (rain) gets frozen on the mountain at very high altitude or freezing due to cold, and drop on earth in form of rain and snow.
4. Fog is a weather condition in which very small drops of water come together to form a thick cloud close to the land or sea or ocean making it difficult to see is known as fog.
5. We can save our buildings from lightning by fitting lightning conductor. Whenever, there is a lightning, it goes directly in the earth with the help of lightning conductor.
6. We must follow the following precautions during lightning:
   1. We should not stand near tall tree or metallic pole.
   2. We should not adjust television antennae.
   3. Remove the cord of antennae from electric appliances if any.

E 1. The state of water can be changed by changing the temperature i.e., by heating or cooling. If we keep a glass of water in the freezer after some time it will freeze. Again, when we take out the glass from the freezer and keep it in room temperature it will melt to its original state. This shows the effect of temperature in water.

2. As the air in contact with the glass cools down, the water vapour present in the air condenses to form water. Thus, when water vapour is cooled it changes back to water. This is known as condensation.
3. When the water in the seas and other water reservoirs heats up, due to heat of the sun, it starts evaporating in the atmosphere. These water vapours also take dust particles with them. They rise high in the atmosphere because they are light in weight because of being heated up by the sun. They reach high in the atmosphere. The temperature there is very low. Due to this they start getting conversed in water form. This water starts setting on the dust particles and forms the clouds.
4. A flash of light in the sky is caused by an electrical discharge between clouds or between a cloud and earth's surface. This flash heats the air and usually causes thunder and lighting.
5. Always lightning is seen first, than the sound of thunder is heard. This is because the light travels faster than sound.
6. A lightning conductor is fitted in all the tall buildings. It is the metal rod, which has spikes at one end, one end is established on the top of the building and the other end burried in the earth, where a copper plate is attached to it. Whenever there is a lightning, it goes directly in the earth without harming the building.
7. Water from the seas, oceans, rivers, ponds etc. gets evaporated due to the heat of the sun. This water goes to the atmosphere by evaporation and it gets condensed in the form of clouds, due to lesser temperature of the upper layers of the atmosphere. When clouds have more than sufficient drop in them the drop start falling in the form of rain on earth. This is called precipitation. Sometimes water drop freezes due to cold, and drop on earth in form of hail and snow. Rain water comes back to water reservoirs directly or is added to the ground water. Rainwater also gets freezed on the mountains at very high altitudes. This snow gets melted during summers and flows back into rivers. In this way, the water cycle keeps going in the natures.

HOTS

1. Lightning can cause short circuiting or rapid fire in the building.
2. The water that gets evaporated from the sea comes back to the sea in the form of rain or melted snow. This is how we can say water cycle is repeated process.

Let's Enjoy

1. Water cycle 2. Hail 3. Condensation
4. Rain 5. Thunder

CHAPTER 17
(Light)

Just Do More (Pg 149)

1. Light is a form of energy.
2. Luminous object – Sun, Candle
   Non-luminous – Book, Table
3. Sofa, Blackboard

Just Do More (Pg 151)

1. Butter paper, milk and tinted plastics.
2. A solar eclipse takes place on a new moon day.
3. Ray of light is the path in which light travels.

EXERCISE

A 1. (b) translucent 2. (b) Book
3. (b) Star 4. (b) Wood
5. (a) moon comes between the earth and the sun

B 1. (d) star 2. (e) glass
3. (a) black patch 4. (b) illusion of an object
5. (c) polished metal

C 1. black 2. reflective 3. light 4. glass
5. Opaque 6. straight line

D 1. Materials which allow light to pass through them easily are called transparent material whereas materials which do not allow light to pass through them are called opaque materials.

2. Transparent material, especially glass is used for many purposes. We use glass in making window panes and doors. Glass is also used in making spectacles and binoculars. Glass is also used in making utensils.

3. An opaque object blocks the light falling on it. This creates an area of darkness on the side of the object away from light. This area of darkness is called shadow.

4. Transparent materials do not cast shadow because they do not block the light falling on them rather light passes through them completely.

E 1. Image is formed in a mirror or any polished surface when light coming from a source falls on an object placed infront of a

mirror, is reflected by the mirror to the eyes creating the illusion of coming from a corresponding series points behind the mirror. A plane mirror forms an image exactly equal to the size of the object but laterally reversed. Laterally reversed means that if you see your image holding an object in right hand, you will see your image in the mirror holding in left band.

2. Reflection of light from a smooth surface is a regular reflection. A beam of light falls on it, the entire beam is reflected in only one direction. Regular reflection takes place in water, mirror and polished meters. Whereas irregular reflection of light is from a rough surface. When the ray or a beam of light falls on the object with an uneven surface, they get reflected to different directions. Irregular reflection takes place in books, cardboards, rocks, walls etc.
3. Make small holes at the centre of three squares. Now place these square cardboards on flat wooden surface in a straight line, so that you could see through the holes of all the three cardboard. Now, place a lighted candle, so that the flame of the candle could be seen through the holes. Now, displace one of the cardboards slightly. So, that the holes are no longer in a straight line. The flame of the candle will not be visible now. This activity shows that light travels in a straight line.
4. Solar eclipse as well as lunar eclipse are wonderful natural phenomena of shadow formation. When these eclipses occur, the sun or the moon is wholly or partially hidden from our view. Whenever the sun, the moon and the earth are in a straight line, a solar eclipse happens. The moon is in between the sun and the earth. In this position the moon does not allow sunlight to fall on certain part of earth and it make it shadow on the earth.

   In lunar eclipse, the shadow of the earth falls on the moon when the sun, the earth, the moon come in straight line, with the earth in the middle the shadow of the earth falls on the moon and it becomes wholly or partially invisible.
5. **Formation :** Shadow is a dark outline formed behind an opaque body, whereas an image is formed by a plane mirror because of the reflection of light by the surface of mirror.

   Colour : Shadow is always black irrespective of the colour of the object. Image is similar to the object in colour.

   Size : The size of the shadow depends upon distance between the source of light and the object, whereas the size of an image of an object is similar to the object.

HOTS

1. No, an object cannot form two on more shadows.
2. Black.

Let's Enjoy

A Do yourself. **B** Do yourself.

CHAPTER 18
(Water and Air)

Just Do More (Pg 157)

1. People need water for bathing, cleaning, washing and cooking. It plays a vital role in our body.
2. Lakes, rivers, ponds, ditches
3. About 74% of earth's surface is covered with water.

Just Do More (Pg 160)

1. Deforestation is cutting down of trees.
2. (i) It erodes the soil.
   (ii) Soil losses its fertility and nutrients.
   (iii) Plants cannot grow on the soil.
3. Flood is good because it retains water capacity in the soil. But on the other hand it also washes away the top layer of the soil which makes soil infertile for growing crops.

Just Do More (Pg 163)

1. 78.08%
2. During respiration energy is released together with the water products of CO_2 and water.
3. Process of respiration is completed in two phases:
   (i) Breathing
   (ii) Release of energy

EXERCISE

A 1. (c) 0.01 percent 2. (b) Collapse of buildings
3. (c) Earthquake 4. (c) Nitrogen
5. (a) Breathing

B 1. True 2. True 3. True 4. False
5. False

C 1. germination 2. frozen 3. climatic 4. flood
5. gills

D 1. Without rain there is no water. Even the air gets dry. Soil gets dry and parched. Continuous dry weather and lack of moisture due to

need of rain is drought. It may occur in climatic regions. Deforestation and excessive use of surface water due to population growth and industrialisation also causes drought.

2. Flood is the situation when soil is full of water and rain water does not get into the soil and the runaway water is not drained into the river. Sometimes, flood also occur near coastal regions due to tidal waves, cyclones or tsunami.

E 1. Effects of drought on people:

- F People do not irrigate crops as water of lakes, rivers, dams, canals, ponds etc. is lost. This result in shortage of food grains and other food item that leads to starvation.
- F People have to migrate from one place to another.
- F People have to travel long distances and fetch water for themselves.

2. Effects of flood on soil:

- F Heavy rainfall causes soil erosion. As top soil is very fertile, so loss of this top soil effects the fertility of the soil.
- F Flood causes water logging in field for a long time. This may lead to the death of small organism present in the soil, which help in maintaining the fertility of the soil.

3. Uses of water are:·

F We need water for drinking, bathing, washing, cooling and cooking our food.
F Water is used for watering plants and crops.
F Water is used for generation of electricity, which is an important source of energy.
F Many kinds of aquatic plants as well as animals live in water. These water plants and animals are useful for us in many ways.

4. Rain is the main source of groundwater. Whenever it rains, water collects in the field. This water percolates down to the soil and reaches below the earth's surface. Thus, the amount of ground water or canal of ground water is maintained.

5. Deforestation is the main cause behind low rainfall. Excessive use of surface water due to population growth and industrialisation also causes shortage of water.

F 1. The two main cause of depletion of water table are:

- F Deforestation – It means to clear the forest land by cutting the trees and shrubs and converting it into commercial or residential purpose. Forest transport large quantity of water into atmosphere through plant transpiration. As the deforestation occur, loss of rainfall takes place which causes depletion of water table.

F Over pumping of ground water– Overpumping of ground water reduces the level of groundwater. Excessive pumping in coastal areas can cause salt water to move in land and upward, resulting in salt water contamination of water supply.

2. Flood is the situation when soil is full of water and rain water does not get into the soil and the runaway water is not drained into the river. Sometimes, floods also occur near coastal regions due to tidal waves, cyclones or tsunamis. Whereas continuous dry weather and lack of moisture due to need of rain is called drought. Drought may occurs in every type of climatic region. During drought, rivers dry, water level in lakes goes down and even the water in the soil dries up.
3. Atmosphere is also made up of air which protects us from ultraviolet rays, coming from the sun. Atmosphere also maintains the temperature of the earth. It does not let the heat escape from the earth's atmosphere, and keeps the earth warm during the nights.
4. Water vapour helps in water cycle. Water vapour also saves us from sun-burn and sunstroke. In the month of May and June, people become the victim of sun's stroke because the air is very dry during these months. But in July and August, the amount of moisture increases in the air, which saves us from sunstroke.

HOTS

1. The water vapours take dust particles with them. They rise high in the atmosphere because of light weight and on being heated by the sun. The temperature above is very low. Due to this they start getting condensed in water form. This water starts setting on the dust particles and forms the cloud.
2. Rainwater has dust, dissolved gases, suspended hydrocarbons in it.

Let's Enjoy

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

CHAPTER 19
(Waste Management)

Just Do More (Pg 169)
Do yourself.

EXERCISE

A 1. (a) domestic waste 2. (a) carbon dioxide

3. (c) Both (a) and (b) 4. (c) Plastic
5. (c) Both (a) and (b)

B 1. harmful 2. Composting, biodegradable
3. domestic 4. Plastic
5. biodegradable substance 6. non biodegradable substance

C 1. (c) biodegradable waste 2. (d) manure
3. (e) the cost of raw materials
4. (a) are non-biodegradable waste
5. (b) get rid of non-biodegradable waste

D 1. Polythene is non biodegradable, rest are biodegradable
2. Raw is biodegradable, rest are non biodegradable
3. Burning of water, as it is not a method of conservation of environment.
4. Healthy environment because rest are the reasons for causing degradation in the environment.
5. Wrapping waste in polythene bag is non-biodegradable, rest all are biodegradable.

E 1. Waste- All thrown away articles which are of no use to us.
2. Non-biodegradable waste – Those substances which cannot be broken into harmless substances.
3. Composting – In this method, the waste are buried into the soil to get decompose and add nutrients in future.
4. Manure – The decomposed product of composting is called manure.
5. Recycling – Reprocessing of the waste material to produce new products.

F 1. Waste materials are those articles which are thrown away and are of no use to us.
2. We should reprocess the waste materials to produce new products i.e., recycling.
3. Advantages of recycling are:
   - F It reduces the amount of energy required to reduce new item.
   - F Saves our money also, as we do not need to buy costly raw material. It makes our surrounding neat and clean.
   - F It makes our surrounding pollution free.
   - F It saves our natural resources as we have to use less raw materials for production of new items.
4. It is the cheap and best way to recycle our waste. In this method the wastes are buried into the soil. It gets mixed with the soil, and add all the nutrients back into the soil. The decomposed product

is called the manure. It is good for growth of the plants. It is rich in nutrients.

5. There is a need to segregate two types of waste i.e., biodegradable and non-biodegrable so that we can reuse and recycle waste efficiently and effectively.

G

1. Composting is the cheap and best way to recycle decomposable waste. In this method, the waste is burried into the soil. It gets mixed with the soil and add all the nutrients back into the soil. The decomposed product is called manure. It is good for growth of plants. It is rich in nutrients.
2. As non-biodegradable waste such as plastic bags, glass etc. cannot be broken down by decomposers, there disposal posses a big problem.

   We can reuse a number of these items such as cans and bottles to store items at home. We can use plastic carry bag for keeping things we buy instead of taking new bags from the shopkeeper. The rest can be sold to scrap dealer for recycling.
3. Recycling involves collecting waste material and processing them to make new products. This is the only way of getting rid of the waste thrown away. First of all, the waste thrown away is collected in huge dustbins. It is then segregated into biodegradable and non-biodegradable waste.
4. The five ways in which waste can be best disposed off are:
   - F By segregating waste into biodegradable and non biodegradable waste.
   - F By composting biodegradable waste in compost pits.
   - F By selling non-biodegradable waste to scrap dealer.
   - F By reusing bottles, cans etc.
   - F By recycling paper and other materials for reusing.
5. Paper is recycled to be used again for making paper carry bags, paper coverings etc. Paper is boiled in presence of starch and then finally grinded. It is then spread into five layers and dried to be used again. Paper is recycled in big mills. It is done with the help of hands also. Hand paper is costlier than mill made paper.
6. Five ways to contribute to a better disposal of waste are:
   - F Always throw all your waste in municipal dustbins instead of throwing them on roadside.
   - F Always sell the waste paper and read out newspaper to the scrap dealer.
   - F You should also sell your plastic and metal waste to scrap dealer instead of throwing them away.
   - F We should always use bags made of cloth or paper so that

plastic bags are not required.

F Plastic and tin cans should be used for storing household things in them.

HOTS

1. Paper bag are useful because they do not pollute our environment as they are biodegradable. But paper itself is made from cutting of trees, which causes deforestation a harm to environment.
2. Yes, because he is recycling waste which is dumped by us.

Let's Enjoy

A
1. Biodegradable
2. Non-biodegradable
3. Biodegradable
4. Biodegradable
5. Biodegradable
6. Non-biodegradable
7. Non-Biodegradable
8. Non-biodegradable
9. Non-biodegradable

B Do yourself.

C Do yourself.

MODEL TEST PAPER 1

A
1. (b) Stem
2. (c) Yeast
3. (a) dehydration
4. (a) winnowing
5. (c) mulberry trees

B
1. (d) Pisciculture
2. (c) is a chemical change
3. (f) Lack of iodine
4. (a) Silk sarees
5. (b) Metal
6. (e) response to stimulus

C
1. False
2. True
3. False
4. False
5. False
6. False

D
1. Animals that feed on plant and plant products only are called herbivores. Whereas animals that feed on other animals are called carnivores.
2. F Solid are that feel hard to touch, have definite shape and occupy definite space.

   F Liquid have no definite shape, not hard to touch and can be poured from one container to another container.

   F Gases are not easily seen, only felt by touch, can be poured from one vessel to another, have neither definite shape nor occupy definite space.
3. A change by which a matter can be brought back to its original shape, state, size, colour or form is called reversible change.

   Whereas a change which cannot be reversed back is called irreversible change.

E.
1. People in our country eat different kinds of food. Their food

habits depend on the availability of food, personal likes and dislikes and production of food in that area.

2. Vitamins are needed for normal functioning of our body. These are important to keep eyes and skin perfect. They keep our teeth and bones strong. They are also helpful in proper functioning of digestive and nervous system.
3. Mud can be filtered through a thin muslin cloth or a filter paper, which will not allow these minute particles to pass through it.
4. When current passes through a circuit the bulb glows.
5. In air, oxygen is emitted by the plants, because they take CO_2 from atmosphere, which is breathed out by the animals and give out oxygen which is required by oxygen.
6. All the biotic components like plants and animals are dependent on the abiotic components like air, sunlight, water for synthesis and derivation of their food.

F

1. Producers are plants because they prepare their own food through the process of photosynthesis.
2. Deficiency of proteins leads to malnutrition in children and they become very weak. This leads to kwashiorkar and Marasmus.

   Kwashiorkar:

   - The stomach of the child gets protrude.
   - Legs becomes swollen.
   - Dark and ugly patches on skin.
   - Discoloration of hair, child growth becomes retarded, he becomes underweight.
   - Anaemia
   - Mental Retardation

   Marasmus:

   - Child becomes extremely underweight.
   - Muscle development is poor.
   - Folds of skin can be seen.
   - Child becomes so thin that bones can be seen through skin.
   - Legs become very thin and weak.
3. Insoluble substances which are heavier than water, settles down at the bottom of container. This process is called sedimentation.

   The clear liquid extracted from sedimentation is then gently procured off into another container without disturbing the sediment. This process is called decantation.
4. Modern mechanised manufacture of textile was first developed in Britain. It was the result of spinning and weaving machines that were invented by Hargreaves. He invented Spinning Jenny

in 1765. The Industrial Revolution in England was a great factor in development of modern machines which mechanised textile manufacturing.

5. Anything that occupies space and has mass is called matter. There are certain properties common to all the matter:
   - F All matter occupies space and has mass. All materials can be touched.
   - F All matters has mass. The amount of matter in an object is known as its mass.
   - F It includes all substances of which universe is made up of.
   - F Matter is present in three states in universe i.e., solid, liquid and gaseous state.

6. F Plants prepare their own food and some organism depend directly or indirectly on the food prepared by plants. In return animals provide them with waste products, which is rich in various nutrients.
   - F Plants give animals oxygen and animals in return give CO_2 to plants for respiration.

MODEL TEST PAPER 2

A 1. (c) Wheat 2. (c) Skull 3. (a) linear motion
4. (c) Copper 5. (c) Nitrogen

B 1. True 2. False 3. True 4. True
5. True 6. True

C 1. A magnetic compass is a simple device which has a magnetic needle on a pivot at the center of a round box. It helps in finding directions.

2. A combination of various conductors joint together is called electric circuit.

3. Reprocessing the waste material to produce new products is called recycling.

D 1. Do yourself. 2. Do yourself.

E. 1. (e) Nervous system 2. (a) Curvilinear motion
3. (b) 1 Km 4. (c) Magnet
5. (d) Zinc container

F 1. The functions played by leaf are:
   - F It makes food for the plant as it undergoes photosynthesis.
   - F It is site for transpiration in plants.
   - F Leaves help the plant to breathe through tiny pores present in them called stomata.

2. Do yourself.

3. The substances which get attracted towards the magnet are called magnetic substances. The substances which do not get attracted towards magnet are called non-magnetic substances.
4. We can save our building from lighting by installing a lightning conductor in the building.
5. Transparent materials do not cast shadows because they do not block the passage of light like opaque materials. Rather the light passes through them completely.
6. Deforestation, excessive use of surface water, population growth, industralisation are the main cause of loss of rainfall.

G

1. The skeletal system in other animals can be mainly of three types:
   - F Endoskeleton – Some animals have their skeletal system enclosed inside their bodies. Such skeletal systems are called endoskeleton system. These skeletons are found in humans, fish, birds etc. Their speciality is that they all have vertebral column.
   - F Exoskeleton – Some animals have skeleton outside their body. Such skeletons are called exoskeleton. Eg. snail, cockroach etc. It gives protection and movement to their body.
   - F Liquid Skeleton – Some organism have liquids in place of bones in their bodies. This liquid helps them in movement. All worms have liquid skeleton.
2. We should not work bare footed because we can get electric shock while working with electricity.
3. Magnetite is the only natural form of magnet. It can attract the iron towards itself. It also have directive property of pointing towards north south direction when suspended. Therefore all the magnet suspend freely towards north south pole.
4. No, an object cannot form two or more shadow at the same time.
5. Atmosphere is also made up of air which protects us from ultraviolet rays coming from the sun. Atmosphere also maintains the temperature of the earth. It does not let the heat escape from the earth's atmosphere and keeps the earth warm during nights.
6. We can get rid of decomposable waste by composting. It is cheap and best way to recycle our waste. In this method, the waste are burried into the soil. It gets mixed with the soil, and add all the nutrients back into the soil. The decomposed product is called the manure. It is good for the growth of the plants. It is rich in nutrients.

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