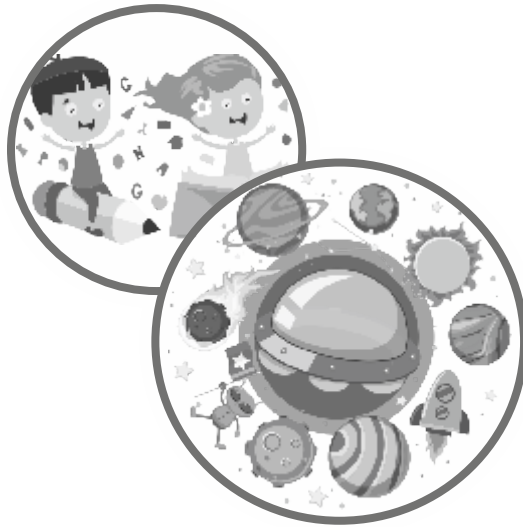


Science Sight

Teacher Manual



Class 6

Class-6
Chapter-1 Food: Where Does it Come From?
Exercise

- A.** 1. (a) 2. (c) 3. (b) 4. (b)
- B.** 1. apiculture 2. caffeine 3. maize, wheat, rice
4. nectar 5. leaves
- C.** 1. (d) 2. (c) 3. (a) 4. (b)

D. 1.

Herbivores	Carnivores
Animals that eat only plants and plant products For example-Horse, goat etc.	Animals that eat raw flesh and meat of other animals. For example- Lion, tiger etc.

2. Three items obtained from animals are: egg, milk and meat.
Three items obtained from plants are: Radish, carrot and cabbage.
3. Cereals are edible grains obtained from cultivated grasses. Cereals are rich in carbohydrates, proteins, vitamins and minerals. The three major cereals are maize, wheat and rice.
4. People from different parts of the country eat different kinds of food because it depends on availability of food for example in south India coconut is found so they eat coconut chutney.
- E.** 1. The material that are required to prepare any food item are called its ingredients.

Food items	Ingredients
A. Dal	Pulses, salt, spices, water, oil.
B. Biryani	Rice, vegetables, salt, spices, water, oil.
C. Dosa	Rice, vegetables, potatoes, spices, water, oil.

2. There are a lot of things that can be eaten in many ways. For example: Rice. We can eat rice with dal by boiling it. We can also make Biryani. Rice are also used for making Idli and dosa. So this way we can eat rice in many ways. Potatoes can also be used in many ways.
3. Food chain is a representation that shows the feeding relationship between various organisms. It also shows the energy flow in nature which starts with the primary energy source, the sun and ends with the consumer.
Diagram- Do it yourself.
4. Some people beg around for food because they do not have enough money to buy food.

HOTS

1. According to me, by eating such meal he/she cannot work or play for whole day because this is not enough for the body. We should have three whole meals a day to get energy.
2. Green plants are known as producers because they make their own food with the help of water, carbon dioxide and sunlight and then they become the source of food for other animals.

Life Skills

Do it yourself.

Chapter-2 Components of Food

Exercise

- A.**
1. (b)
 2. (d)
 3. (c)
 4. (b)
 5. (c)
- B.**
1. anaemia
 2. balanced
 3. nutrients
 4. rickets
 5. Goitre
- C.**
1. Iron deficiency causes anaemia. Symptoms of anaemia are:-
The person looks pale, feels very weak, gets tired easily and loses weight.
 2. Fresh food and raw vegetables are good source of roughage. They help the body to get rid of waste easily. Lack of roughage leads to constipation.
 3. The deficiency of iodine causes goitre. The symptoms of goitre is: abnormal enlargement of thyroid gland situated in our neck.
- D.**
1. The diet which contain adequate amount of all the nutrients such as vitamins, minerals, carbohydrates, fats and proteins is called balanced diet. Diet differs in child and adults because children need a diet which will help them in growing such as protein rich diet. Children need more protein because of rapid growth of their body.
 2. The deficiency of vitamin-B in food causes Beri-Beri. The symptoms are as follows:
 - a) The muscles of the person become very weak and he has very little energy to do work.
 - b) The person may suffer heart failure or become paralyzed and then die.
 3. The deficiency of proteins in the diet of small children causes a disease known as kwashiorkor. The symptoms of protein deficiency in children are:
 - a) The hair of child changes colour and becomes red.
 - b) The skin of child cracks and becomes scaly.
 - c) The child has stunted growth.
 - d) The child becomes weak and irritable.

HOTS

1. A young person needs more protein because of the rapid growth of their body. Protein helps in making new cells and in development of their body.
2. Malnutrition is seen in poor children because they are unable to take proper meal i.e, three times a day due to lack of money.

Life Skills

Do it yourself.

Chapter-3 Fibre to Fabric

Exercise

- A.** 1. (c) 2. (a) 3. (b) 4. (a)
5. (a)
- B.** 1. T 2. F 3. T 4. F
5. F
- C.** 1. looms 2. Nylon, rayon 3. sericulture 4. plant
4. plant 5. black soil 6. shearing
- D.** 1. Before the inventions of clothes. People used animals skins and the barks and leaves of trees as clothes.
2. Thin hair like strands of threads that are woven to make fabric are called fibre. Different kinds of natural fibre are cotton, jute fibre. Different kinds of natural fibres are cotton, jute, silk, wool etc.
3. Fabrics manufactured in factories using chemicals is called synthetic fibre for example: Nylon, rayon and polyester.
4. Synthetic fibres are strong, do not get wrinkled and dry up easily.
- E.** 1. To obtain fabric from fibre involves two processes:
- weaving- It is the process of arranging two sets of yarns together. Fabrics are woven using a machine called loom.
 - Knitting- Knitting is a process that make use of a single yarn to make piece of fabric.
2. The process of obtaining jute yarn from the plant is as follows:
- Retting- The process of soaking jute stalks in water to let them rot. After this stripping, rinsing, washing and cleaning is done and the fibre is dried in the sun and pressed into bales.
 - Spinning- The process of making yarn from fibre is called spinning.

Natural Fibres	Synthetic Fibres
Fibres obtained from plant are called natural fibres. For example- cotton, jute etc.	Fibres that are human-made are called synthetic fibre. For example.- Nylon, rayon etc.

4. Steps involved in cotton making are:
- Picking – The cotton fibres are collected by hand from the ripe cotton balls. This process is called picking.
 - Ginning – Cotton fibres are separated from the seeds by combing them.
 - Spinning – Process of making yarn from fibres.
 - Weaving – Two yarns are arranged together to make a fabric.

5.

Fibres	Sources	Uses
Cotton	cotton plants,	for making towels, bedsheet, clothes etc.
Jute	stem of Jute plant,	for making bags, ropes rugs, carpets etc.
Silk	cocoon of the silk moth	for making sari, kurta shawl etc.
Wool	from hair of sheep, goat, yak, camel	for making goat, yak, camel, warm clothes.

6. Synthetic fibre are strong, do not get wrinkled and dry up easily therefore they are preferred over natural fibre.

HOTS

1. Wearing many layers of cotton will keep us warm because it will retain the heat and won't let air to pass through.
2. Do it yourself.

Life Skills

Do it yourself.

Chapter-4 Kinds of Materials

Exercise

- A.** 1. (a) 2. (d) 3. (c) 4. (d)
5. (a)
- B.** 1. mud 2. round 3. insoluble 4. floats
5. opaque 6. hard 7. liquid 8. soluble
- C.** 1. (d) 2. (c) 3. (b) 4. (e)
5. (f) 6. (a)
- D.** 1. False 2. False 3. True 4. False
5. True
- E.** 1. Thermocol, wooden block.
2. Gloves, toys, tyres, raincoats, boats.
3. We will dissolve honey in water. If it is pure it will not dissolve in water, it will sink.
4. The object through which we can see clearly are transparent whereas through which we cannot see at all are opaque objects.

5. Solids have definite shape and volume whereas liquids do not have definite shape.
- F.** 1. The substances which dissolve in water are soluble for example:- sugar in water. The substances which do not dissolve in water are insoluble. For example:- sand in water.
2. Soluble substances: The substances which dissolve in water are called soluble substances.
- Transparent object: Objects through which we can see clearly are transparent objects.
 - Opaque objects: Objects through which we cannot see are called opaque objects.
 - Lustre: The shine on the surface of metal is called luster.
3. The process of grouping things on the basis of some criteria is known as classification. Classification is useful because it allows us to identify things easily.

Solid	Liquid	Gas
Solids have definite shape and volume.	Liquids do not have definite shape but they have definite volume.	Gases do not have definite shape and volume.
They cannot flow.	They can flow.	They can flow very easily.
For example:- wood, table etc.	For example:- water.	For example: water vapour.

5. A body that is lighter than the weight of water floats on the surface of water.

HOTS

1. Biologists use classification intensively because it allows them to identify things easily.
2. Paper-floats, polythene-floats, cellphone-sinks, eraser-sinks, plastic ball-floats.

Life Skills

Do it yourself.

Chapter-5 Substances

Exercise

- A.** 1. (a) 2. (a) 3. (a)
- B.** 1. separating funnel 2. condensation
3. insoluble, liquid 4. winnowing
5. Winnowing
- C.** 1. (d) 2. (a) 3. (b) 4. (c)
- D.** 1. During sedimentation, heavier coarse particles settle down quickly. Fine particles of clay settle down very slowly. The fine particles can be made to settle faster by dissolving a small quantity of alum in muddy water. This method is called loading.

2. Solubility of a solid solute increases with rise in temperature. For eg: sugar at 25°C dissolves 20 kg in 100 g of water.
 3. The solution in which solvent is water is called aqueous solution. Solubility of solid changes with rise in temperature as: Sugar dissolves 20 kg in 100 ml of water at 25° C. Salt dissolves 36 g in 100 ml of water at 25°C. This is the maximum amount of solute that can be dissolved in 100 g of water.
 4. Sedimentation and decantation.
 5. Cream can be obtained by churning from fresh milk.
- E.**
1. Homogeneous mixture are those that are well mixed and their constituents are distributed uniformly. They appear the same throughout. For example- sugar solution.
Heterogeneous mixture are those that do not have a uniform composition throughout. They do not appear the same throughout. For example: sand in water.
 2. Sedimentation and decantation is used for separating coarse particle of a solid from a liquid which are insoluble in the liquid.
 3. A liquid substance that dissolves in water completely in all proportion is called miscible liquid. For example alcohol is miscible.
 4. Maximum amount of a solute that can be dissolved in 100 g of the solvent at any specific temperature is called its solubility. 36 g of salts dissolve in 100 g of water at 25°C.

HOTS

1. We will first separate sand from the mixture by sedimentation and decantation and then we will separate oil by separating funnel.
2. Common salt can be separated by the process of sieving.
3. Solubility increases with increase in temperature that is why it is easier to dissolve sugar in milk in summers.

Life Skills

Do it yourself.

Chapter-6 Changes Around US

Exercise

- A.**
- | | | |
|-------------|------------------|-------------|
| 1. Chemical | 2. rusting | 3. physical |
| 4. chemical | 5. Gases, solids | |
- B.**
- | | | | |
|------|------|------|------|
| 1. T | 2. F | 3. T | 4. F |
| 5. F | | | |
- C.**
- | | | |
|--------------|-------------|---------------------------|
| 1. physical | 2. chemical | 3. solids, liquid and gas |
| 4. expansion | | |
- D.**
1. Some changes take millions of years to occur. These type of changes are called slow change. For e.g- Formation of coal and petroleum.
 2. Some changes take place very fast such as burning of crackers, such changes are called Fast changes.
 3. A change which leads to formation of a new substance is called a chemical change, e.g burning of paper.

4. When we heat a substance, its particles gain energy and start moving away from each other. This is called expansion.
5. When the air particles in a substance come closer and occupy less space. This is called contraction.

E. 1. a) Reversible changes

A change that can be reversed is called a reversible change For e.g- melting of ice, melting of chocolate. etc

b) Desirable change

A change which is beneficial is a desirable change For e.g- ripening of fruits, cooking of food etc.

c) Expansion

When we heat a substance, its particles gain energy and starts moving away from each other, is called expansion

Irreversible changes

A change that cannot be reversed is called a irreversible changes, Formation of coal, tearing of paper etc.

Undesirable change

A change which is harmful is an undesirable change For e.g- floods, drought etc.

Contraction

When the air particles of of a substance come closer and occupy less space is contraction.

2. Germination of seed is considered as chemical change because new substance is formed.
3. (a) moulding of clay- Physical change, reversible change.
(b) Evaporation of water- Physical change, reversible change.
(c) Change of milk to curd- Chemical change, irreversible change.
4. Pulling of string is a reversible change because it can be reversed when no force is applied.

F. 1. A change in which no new substance is formed is called a physical change. For example: tearing of paper.

2. A change in which new substance is formed is called chemical change. For example- Milk changing into curd, and burning of paper.
3. Cooking of food is called chemical change because new substance is formed which cannot be revered.
4. Small gaps are left on the railway tracks because in summer when the temperature is high, the metal tracks expand. If the gaps are not left, the tracks will deform at joints. In winter again, the metal contracts and the gap increases.

HOTS

Do it yourself.

Life Skills

Do it yourself.

Chapter-7 Getting to Know Plants

Exercise

- A.** 1. (a) 2. (a) 3. (a) 4. (b)
5. (b)
- B.** 1. Flower 2. stamen 3. carpel 4. ovules
- C.** 1. Dodders - Parasitic roots
Bamboo - Prop root
Potato - Tuber
Sharp prickles - Bougainvillea
Sepals - Protect the flower
- D.** 1. Two main types of root system are: Tap root system and fibrous root system.
2. Three root modification are:
i) For storage of food, the root become fleshy like carrot and raddish.
ii) For multiplication, roots of plants like dahlia and asparagus can develop into new plants.
iii) For climbing same plants have climbing roots that help the plant to climb up a support like a wall or tree, e.g money plant, black pepper.
3. The arrangement of veins in a leaf is termed as venation. The two types of venation are parallel venation and reticulate venation.
4. The loss of water through the stomata is called transpiration. This help the plants in following ways:
i) Transpiration helps in the transportation of nutrients within the plants.
ii) It helps in cooling of leaves.
5. The transfer of pollen grains from on anther to a stigma is called pollination.
Many flowers are brightly colored and have a sweet smell to attract insects like bees. When the insect sits on a flower, the pollen grains sticks to its body and may get rubbed off when it sits on another flower.
- E.** 1. The different functions of a root.
i) Anchor plants.
ii) Absorbs and inducts water and nutrients.
iii) Prevent soil erosion.
iv) increases soil fertility.
2. It bears flowers, buds, leaves and fruits.
• Green stem has chlorophyll and can carry out photosynthesis.
• It has nodes from which leaves arise.
• It conducts water and mineral salts from the roots to the leaves.
3. The functions of a stem are:
i) To manufacture food: Stem of same plants become flattened to perform photosynthesis.

- ii) For storage of water: Stem of some plants swell up to store water.
 - iii) Protection: Stem may be modified as thorns to protect them from being eaten by animals.
 - iv) For support: Stems of some climbers are modified to form special structure, animals tendrils.
 - v) For storage of food: Potato, onion and ginger modified stems that store food
4. Diagram-Do it yourself.
 5.
 - Leaf prepares food for the plant by the process of photosynthesis.
 - Plants breathe with the help of their leaves
 - Leaves also lose water with the help of stomata.
 - Plants store food in the leaves, fruits and stems in the form of starch.

HOTS

1. Wind pollinated flowers don't need to be attractive to insects. They are usually small, do not produce nectar or have large colourful petals.
2. Making of food by leaves for the plants is different from making of food by our mother because plants make their own food with the help of sunlight, carbon dioxide and chlorophyll. Whereas our mother makes food by the products that we get from plants.

Life Skills

Do it yourself.

Chapter-8 Body Movement

Exercise

- | | | | |
|----------------------------|------------------|--------------|--------|
| A. 1. (d)
5. (a) | 2. (b)
6. (d) | 3. (a) | 4. (a) |
| B. 1. T
5. F | 2. F
6. T | 3. F
7. T | 4. T |
| C. 1. (d)
5. (c) | 2. (e) | 3. (b) | 4. (c) |
- D. 1. In unicellular organisms, single cell performs various functions whereas in multicellular organisms, there are many different cells to perform functions.
 2. The body of the fish is streamlined in shape. The wave like movement of its body pushes the fish forward.
 3. Out of the 12 pairs of ribs, 2 of them at the end, are free. These are known as floating ribs.
 4. Immovable joints are fixed joints. The bones of an immovable joint together form a single protective covering. At movable joints one bone moves freely on the other.
 5. Spine forms a bony tube which protects the spinal cord that passes through it.

- E. 1. Main functions of skeleton are:
- Supporting framework- It forms the framework that supports and gives shape to the body.
 - Protection- It surrounds and protects inner delicate organs like lungs, heart, brain etc.
 - Attachment of muscles for movement and locomotion- It provides attachment to the skeletal muscles and helps in the body movement.
 - Storage of minerals- Bone stores essential minerals like calcium and magnesium.
2. Ribcage is the arrangement of ribs attached to vertebral column and sternum in the thorax of most vertebrates. It protects lungs and heart.
3. Joints are of three types:
- Immovable Joints or fixed joints- The joints found between the skull bones are immovable joints. The bones of an immovable joint together form a single protective covering.
 - Partially movable joint- These joint allow partial movements of bones. For example: joint between two vertebrae.
 - Freely movable joint- At freely movable joints, one bone move freely on the other. Such joints are found in shoulder, hip, knee, elbow.
4. Main organ of nervous system are: brain, nerves and spinal cord.
5. Birds have wing to fly in the air: Their body is streamlined which makes it way through the air easily. They have strong and hollow bones which are filled with air. This makes the body of the bird light for flying. Birds fly by flapping their wings.
6. Bones cannot move by themselves. The muscles attach to the bones make them move at joints. The bones act as levers and joints as fulcrum. Contraction and relaxation of muscle make the bone move up and down.

HOTS

1. The structural composition of backbone allows us to bend, crouch, stand or lie down on the ground. The small bones promote this movement. If backbone was made up of one long bone then we would never be able to sit, crouch or lie.
2. Divers wear fin- like flippers on their feet to make their body to get streamlined which helps to reduce the drag of water acting on this body, thus helping them to move easily and quickly in deep water.

Life Skills

Do it yourself.

Chapter-9 Things Arouds Us: Living and Non-Living

Exercise

- A. 1. (c) 2. (c) 3. (c) 4. (a)
5. (b)

- B.**
- 1 Ecology is the study of how organisms interact with one another and with their physical environment.
 2. Hibernation helps dormouse to withstand extreme cold winters of temperate regions where it is found. They can hibernate for 6 months.
 3. Flexible stalks and strong roots prevent breakage of grass in windy conditions.
 4. Deer eats grass and leaves. The adaptatoin it has is, that they have strong flat hind teeth for chewing plants.
 5. Organisms that can make their own food are called producers. Green plants make their own food from carbon dioxide and water, using sunlight so they are known as producers.
 6. Lions have strong claws that can be withdrawn inside their toes. This helps creep them to up to their prey without making sound while hunting.
 7. The streamlined bodies help water animals as it reduces resistances due to water and help them to swim fast in water.

C.

1.

Herbivores	Carnivores	Omnivores
Animals that eat plants are called herbivores. For example- cows, buffaloes etc.	Animals that eat other animals. For example- Tiger, Lion, wolf, etc.	Animals that eat both plants and animals are called omnivores. For example- bears, crows etc.

2. Two ways in which plants are useful to animals are:

- Plants give animals oxygen to breathe.
- Plants give us fruit, flower and vegetables.

Two ways in which animals are useful to plants are:

- Animals give carbon dioxide to plants to prepare food.
- When animals die they decompose in the soil and make it more fertile.

3.

Biotic	Abiotic
<ul style="list-style-type: none"> • The living part of the environment is called biotic component or the biological component. • For example- Plant, animals and micro organisms. 	<ul style="list-style-type: none"> • The non-living part of the environment is called abiotic component or physical component. • For example- Soil, sunlight, air, water and temperature etc.

4. Plants and animals have features that help them to survive in a particular type of habitat. These are known as adaptations. Adaptation is important to survive in a particular place. For example- fish has gills to survive in water, camel has long legs to keep its body away from the heat of the sand and a hump to store water.

5.
 - Rainforest animals use camouflage to escape from enemies. For example- it is very difficult to differentiate a stick insect from a stick so, it helps them to match with the stick.
 - Camouflage is useful for predator to catch prey. For example- tigers with their yellow coats with black brown stripes.
6. Lions have eyes in front of their faces which help them to give a correct idea about the location of their prey.
Deer have eyes on the sides of their heads which enable them to look in all directions for danger.

HOTS

1. Rainforest are dense and thick with high rainfall. Sunlight does not penetrate very much in the forest so, the undergrowth in this type of forest is restricted which makes walking through rainforest easy.
2. Camels are able to survive without water for a long time because they drinks large quantity of water at a time and it excretes very little water. It has developed a hump on it back to store water for many days.

Chapter-10 Motion and Measurement

Exercise

- A.**
- | | | | |
|--------|--------|--------|--------|
| 1. (b) | 2. (b) | 3. (b) | 4. (c) |
|--------|--------|--------|--------|
- B.**
- | | | | |
|---------------------------|-----------------------|---------|----------|
| 1. cart | 2. Wheel | 3. 1000 | 4. cubit |
| 5. Oscillatory, vibratory | 6. non-uniform motion | | |
- C.**
- | | | | |
|------|------|------|------|
| 1. T | 2. T | 3. T | 4. T |
| 5. F | 6. F | | |
- D.**
1. It is important to have a standard system of units for uniformity and convenience.
 2. Multiples are necessary for measuring large quantity. Sub-multiples are necessary for measuring smaller quantity.
 3. Translatory motion is of two types.
 - Rectilinear motion- If a body moves in straight line it is called rectilinear motion.
 - Curvilinear motion if a body moves along a curved path it is called a curvilinear water.
 4. Thickness of 300 sheets= 30 mm
Thickness of 1 sheets= $30/300 = 1/10 \text{ mm} = 0.1\text{mm}$
 5. Yes, this is uniform motion as the car covers equal distances in equal interval of time.
 6. When an object turns around its internal axis (like the Earth turns around its axis) it is called rotation. When an object moves around an external axis (like the Earth circles the sun) is called revolution.

7. Irregular motion of a body in which the direction of motion is not fixed is called random motion. For example: football player on a field, flitting of a butterfly.
8. If an object does not show any change in its position with time, it is said to be at rest.

E. 1.

Uniform Motion	Non-Uniform Motion
<ul style="list-style-type: none"> • Body particle move along a straight line. • It covers equal distance in equal interval of time. • For example- Movement of a car on a straight road with constant speed. 	<ul style="list-style-type: none"> • Body particle covers unequal distance in equal intervals of time. • It covers equal distance in unequal interval of time. For example- Motion of a car on a crowded road.

2. Precautions to be taken while measuring length using ruler are:
 - Proper placement of scale.
 - Position of eye should be correct.
3.
 - To measure a curved line using a thread we need white sheet of paper, cotton thread, board pins, drawing board and a half scale.
 - First we need to draw a curved line on white sheet of paper and mount it on drawing board.
 - On the drawing board we will fix some board pins on the sharp turning of the curved line.
 - Then we will tie a knot with cotton thread at the point marked as 1. We will move the thread along the covered line such that it goes around the pins 2,3,4 etc.
 - When the thread will reach at the end of the curved line. We will cut it at that point.
 - Then we will remove the thread from point 1 and then place it along the length of a metre scale.
 - The length of the thread is equal to the length of the curved line.
4. Rest and motion are related to each other. For example: If we place a clock on our palm and take few steps. The clock is at rest with respect to our body but it is motion with respect to other object in the room.
5.
 - When a person rides a bicycle, the cycle as well as the cyclist shows translatory motion but the wheels show rotatory motion.
 - When a screw is opened, it shows rectilinear as well as rotatory motion.

HOTS

1. Movement of a simple pendulum is said to be an oscillatory motion and not vibratory motion because the pendulum moves to and fro from its mean position whereas in vibratory motion whole object does not move to and fro. Scale is straight so we cannot measure curved line with thread.
2. Mosquito shows random motion across a room because it moves in any direction. The motion is irregular.

Life Skills

Do it yourself.

Chapter- 11 Light, Shadow and Reflection

Exercise

- A. 1. (d) 2. (b) 3. (a) 4. (a)
- B. 1. artificial 2. translucent 3. Opposite
4. rectilinear propagation 5. beam
- C. 1. T 2. T 3. F 4. F
5. T
- D. 1. Natural-sun, Artificial-candle
2. Frosted glass isn't opaque but we can't see through it. It is hopelessly blurred because it scatters light so that any image seen through it is hopelessly blurred.
3. Shadow is longest during night and morning.
4. Clear inverted image is formed by a pinhole camera.
5. A ray of light is the path along which light travels-A collection of rays along a definite direction is called a beam.
6. ~~PLANE~~
- E. 1. Three characteristics of shadow are:
• Shape of the shadow depends on the position of the object.
• Size of the shadow decreases if the opaque object is moved close to the screen and away from the source.
Size of the shadow increases if the opaque object is moved away from the screen and close to the source of light.
2. The position of the screen inside the pinhole plays an important role because if the screen is moved further in front i.e. towards the pinhole the size of the image becomes smaller and brighter and remains inverted. If the screen is further moved away from the pinhole, the size of the inverted image becomes bigger and blurred.
3. • Light a candle and place it on the table.
• Look at the candle flame through a straw. It will be seen clearly.
• Now bend the strawpipe and again look through it. Flame will not be seen.
• This shows that light travels in a straight line.
4. Conditions necessary for the formation of shadow are:
• a source of light
• an opaque object
• a screen
5. The inner sides of the pinhole camera are painted black as it helps in the clarity of the image. Black surface can absorb light rays so that if any extra light enters through the pinhole from outside, it gets absorbed and does not disturb the image of the object. In the absence of black surface, it would lead to the formation of blurred image.

6. An image is formed when light coming from a lighted object is reflected by the surface. It is different from shadow, as shadow only shows outlining of the object whereas image is detailed information.
7.
 - Sunlight is converted into solar energy due to which we are able to do many works.
 - Sunlight also gives energy to plants due to which they are able to make food.

Image	Shadow
<ul style="list-style-type: none"> • Image gives detailed information like the colour, texture, structure of the object. • Image is formed due to reflection of light from a smooth polished surface. • Image undergoes lateral inversion. 	<ul style="list-style-type: none"> • Shadow gives only outline of the object. • Shadow is formed due to obstruction in the path of light by an opaque body. • Does not undergo lateral inversion.

HOTS

We can see through windowpane of glass. We can see through it as light can pass through it and we can see the image as it has little bit reflective back surface.

Life Skills

Do it yourself.

Chapter- 12 Electricity and Circuits

Exercise

- A.** 1. (b) 2. (c) 3. (a) 4. (c) 5. (b)
 6. (b)
- B.** 1. (e) 2. (a) 3. (b) 4. (c) 5. (d)
- C.** 1. Insulator 2. Positive, negative
 3. Electric circuit 4. Tungsten
 5. Solar cell
- D.** 1. F 2. F 3. F 4. F 5. F
- E.** 1. Electric circuit is the path from one terminal of an electric cell, through a bell and switch to the second terminal of the cell.
 2. A switch is a simple device that is used to either break the electric circuit or to complete it.

Conductor	Insulator
<ul style="list-style-type: none"> • Material which allow electric current to pass through them are called conductors. • For example-silver, graphite etc. 	<ul style="list-style-type: none"> • Materials which do not allow electric current to pass through them are called insulators. • For example- rubber, plastic etc.

4. Copper wires are covered with plastics because plastic is an insulator and so we will not get an electric shock.
- F.**
1. Electric cell is a device which produces small amount of electricity. It has two terminals- positive and negative.
If two or more cells are joined together, they make a battery.
Diagram- Do it yourself.
 2. When the filament of a bulb gets broken, the bulb is said to be fused. It does not glow because a break in filament means a break in the path of electricity between the terminals of the cell, the circuit gets open and electricity cannot pass through it.
 3.
 - We should always wear- rubber soled shoes or rubber-chappals to while operating electrical appliances.
 - We should not touch electrical appliances if our hands are wet.
 - We should always wear rubber gloves while handling naked electric wires.
 4. The torch bulb has two terminals. When the two terminals of a cell are connected to the two terminals of a torch bulb by using wires, the electric current passes through the filament of the bulb and it starts glowing. The torch convert electrical energy into light energy.
 5. Diagram-Do it yourself.
 6. Electric circuit is the path from one terminal of an electric cell, through a bulb and switch to the second terminal of the cell.
Diagram-Do it yourself.
 7. The filament of the fused bulb is broken due to which path of the electricity is broken and the bulb does not glow whereas in normal bulb the filament is not broken and hence the circuit is closed and the bulb glows.
Diagram-Do it yourself.

HOTS

1. Insulator.
2. Conductor, it could be copper.
3. Electric plug is made of metal which is a conductor but outer case is made of plastic which is an insulator.

Chapter- 13 Magnetism

Exercise

- A.**
- | | |
|-------------------|--------------------|
| 1. north-south | 2. they are heated |
| 3. Repulsion | 4. compass |
| 5. attract, repel | 6. lodestone |
| 7. artificial | |
- B.**
- | | | | |
|------|------|------|------|
| 1. F | 2. T | 3. F | 4. T |
| 5. T | 6. F | | |

- C. 1. (d) 2. (a) 3. (e) 4. (b)
 5. (c)
- D. 1. Poles of a bar magnet are located at the end.
 2. A freely suspended magnet points towards north-south direction.
 3. Permanent magnet lose their magnetism if they are hammered.
 4. Permanent magnet - Those magnets that retain their magnetism once magnetized. For example- iron, nickel etc.
 Temporary magnet- Those magnets that behave like permanent magnet when in the presence of magnetic field but loses magnetism when not in a magnetic field. For example electromagnet.
 5. Magnetic field is an area around the magnet where its effect can be felt. It depends upon current and distance of observation point from the magnet.
- E. 1. A magnet can attract the opposite pole of other magnet as well as the magnetic substance. When two magnets or magnetic objects with like poles face each other, a force of repulsion pushes them apart. So, if magnet repels the object, then we can say that other object is a magnet. These, repulsion is a sure test for magnetism.
 2. Iron rod can be magnetised by placing it near the magnet as far as the magnet is connected it will produce magnetism and if the magnet is removed, it won't show magnetism.
 3. The blade of sharpener is made up of iron due to which sharpener gets attracted by the poles of a magnet.
 4. Do it yourself.
 5. When a permanent magnet is heated, it loses its magnetic property. Yes it can retain its property if it is cooled down.

HOTS

1. Yes
2. If a magnet is brought near a compass its needle gets deflected due to magnetic field of the magnet.

Chapter- 14 Water

Exercise

- A. 1. (b) 2. (b) 3. (c) 4. (c)
- B. 1. gaseous 2. temperature 3. freezing 4. water
 5. rainwater harvesting 6. drought
 7. Tidal waves 8. melting
- C. 1. T 2. F 3. T 4. F
 5. T 6. T 7. F
- D. 1. The products and features of the earth that allow the existence of life and satisfy the needs of living organisms are called as natural resources.

2. Renewable resources are those that will either never run out or are renewed through relatively rapid natural cycles.
 3. Non-renewable resources are those that once used up are exhausted.
 4. 97% of the Earth's surface is covered with water.
 5. Water, minerals.
 6. Ground water is the water that seeps through the soil and collects above the non-porous rocks deep under the ground.
 7. Water is polluted by-
 - Wastes from homes and factories.
 - Uses of fertilizers and pesticides.
- E.**
1. Factors that contribute to lowering of the water table:
 - Increase in population, agricultural and industrial growth affect our water resources.
 - Wastes from our homes and factories are dumped in water bodies such as river, which pollute them.
 - Fertilizer and pesticides get washed off by rain into water bodies, causing pollution. Thus pollution further reduces the clean water available to us.
 2. Water can be conserved by following ways:
 - Avoiding wastage of water and recycling water in places factories and even homes.
 - Planting trees and other vegetation as they help in absorption of water by the soil.
 - Reducing water pollution by treating sewage and industrial wastes before disposing them.
 - Controlling floods and storing rainwater by building dams.
 - Collecting and storing rainwater at home for further use.
 3. Rainwater harvesting is the storing of rainwater, either in tanks or directing it into deep holes in the ground to replenish ground water.
 4. Due to different climatic and rainfall patterns in different regions, it has been experienced that while some parts are suffering devastated flood, another part is suffering drought at the same time.
 5. Diagram- Do it yourself
Importance-
 - It regains the water lost from the water bodies.
 - It recharges the underground water.
 - It continues the supply of fresh water to the river.
 6. Main causes of water pollution are:-
 - Waste from homes and factories are dumped in water bodies that pollutes them.
 - Fertilizer and pesticides get washed off by rain into water bodies causing pollution.

HOTS

1. If water has not recycled in nature, there would have been no climatic change, all the water resources would have been depleted.
2. Leafy vegetables get reduced in quantity because they contain chlorophyll and water in its fibre which get evaporated after being cooked.

Life Skills

Do it yourself.

Chapter- 15 Air

Exercise

- A.** 1. (c) 2. (b) 3. (c) 4. (c)
5. (b)
- B.** 1. Atmosphere 2. Space weight
3. mixture 4. dissolved
- C.** 1. T 2. T 3. T 4. F
5. F
- D.** 1. When the lid is tightly screwed, the pressure outside the jar become greater than pressure inside the jar.
2. Importance of carbon dioxide
· It extinguishes a burning fire.
· Green plants need carbon dioxide gas to make food.
3. Water rises in the dropper due to atmospheric pressure. When bulb is pressed, air present in tube escapes in the form of bubbles.
4. The candle heats the air and expands it. This cancels the depletion of oxygen temporarily and water level stays down. When the oxygen is depleted, the candle goes out and the air cools. The volume of the air decrease and the water rises.
- E.** 1. Importance of air:
· Air helps human beings in breathing.
· Air is used for burning fuels.
· Compressed air is used to fill tyres.
· Air is also used for inflating balloons.
· Air helps in dispersal of seeds.
2. Importance of oxygen:
· Oxygen is important for living beings for breathing.
· Oxygen helps in burning.
3. The water of ponds, lakes, river and seas has some dissolved air in it. So, the animals and plants which live in water use the air dissolved in water for breathing.

4. Carbon dioxide is essential for plants and plants are necessary for human beings and animals. It also helps in extinguishing fire. on the other hand excess of it can also cause many diseases.
5. Contamination of the environments by dirty and harmful substances is called pollution. Air is polluted in following ways-
 - Smoke coming out of the tall chimneys of a factory.
 - Smoke emitted by vehicles.
 - Smoke emitted when plastic is burned.

HOTS

Ozone layer depletion causes increased UV radiation levels on the Earth's surface, which is damaging to human health. Ozone layer depletion occurs when chlorofluorocarbons are halons-gases found in aerosol spray cans and refrigerants. It can be prevented by using ACs that do not use CFCs as refrigerant and by aerosol products that do not use CFCs.

Life Skills

Do it yourself.

Chapter- 16 Dealing with Wastes

Exercise

- A.** 1. (c) 2. (d) 3. (a) 4. (a)
 5. (d) 6. (a)
- B.** 1. biodegradable 2. disposal
 3. Incineration 4. water
 5. Composting 6. resources, pollution
- C.** 1. T 2. F 3. F 4. F
 5. F
- D.** 1. Burning of waste is called incineration.
 2. Composting is useful for plants because it enhances the quality of the soil.
 3. Liquid waste from kitchen and toilet is called sewage.
 4. Rag Picker collect only the things that can be recycled and sold in the markets.
 5. Materials that can be recycled are glass, wood, metals such as silver, iron, aluminium and copper.
 6. Solid waste is called refuse.
- E.** 1. Soak pit is a method to dispose off the waste water. It is a pit in the ground filled with pebbles or brick pieces. Sewage flows into the soak pit through pipes or drains. The water is drained in the ground.
 2. Sanitary landfills are dug at a place away from the residential areas. The waste is dumped into the trenches. The wastes are covered with soil each day. The cover of the soil prevents insects from getting into the refuse. This method is used to dispose off non-biodegradable or poisonous substances.
 3. Recycling is a process of getting materials from the waste that can be reused. It involves breaking down of old things to make new ones. Materials that can be recycled are: glass, wood, fibre from paper products etc.

- 4.
- | Biodegradable substances | Non-biogradable substances |
|--|--|
| <ul style="list-style-type: none"> Waste that rot by the action of decomposers are called biodegradable substances. Example- leftover food, peels of vegetables. | <ul style="list-style-type: none"> Waste that do not rot by the action of decomposers are called non-biodegradable. Example- Polythene bags. |
5. Preparing compost from biodegradable waste with the help of worms is called vermicomposting. It is very useful as it produces organic fertilizers in our home.
6. Rotating and conversion of some materials into manure is called composting. The main difference between composting and vermicomposting is that composting produces manure whereas vermicomposting organic fertilizer.

HOTS

- Plastic was thought to be a boon but it turned out to be a curse as:
 - It is harmful as it produces harmful gases when burnt.
 - It is harmful to the soil.
 - It clog the drainage and sewage system.
- If there was no plastic, there would have been less pollution or no pollution at all. People would use paper or cloth bags.
- Plastics are not biodegradable because they are made up of such materials which cannot decay and on which microbes cannot live.

Model Test Paper-1

- A.** 1. (c) 2. (b) 3. (b) 4. (a)
- B.** 1. Maize, wheat, rice 2. loom
3. miscible 4. winnowing
- C.** 1. T 2. F 3. T 4. F
- D.** 1. (d) 2. (c) 3. (a) 4. (b)
- E.** 1. Each thread or yarn is made of still thinner strands called fibres. Natural fibre are- cotton, silk, wool, jute etc.
2. Fine particals that settle down slowly are made to settle faster by dissolving small amount of alum in muddy water. This is called loading.
3. The arrangement of veins in a leaf is termed as venation. The two types of venation are:- Parallel venation and Reticulate venation.
- F.** 1.
 - Soluble substance- A substance when added to water forms clear solution, is called soluble substance.
 - Transparent objects:- The objects through which we can see clearly are called transparent objects.
 - Opaque objects: The objects through which we cannot see at all are called opaque objects.
 - Lustre: Soft glow due to reflection of light on the surface is called lustre.
2. A change in which basic composition of a substance does not change is called a physical change. For example- melting of ice, mixing of salt in water.
3. Different types of joints are:

- Ball and socket joint- The end of one bone is rounded as a ball. It fits into the socket of other bone. For example- the shoulder joint between the head of upper arm bone.
- Hinge joint- This joint allows movement of one bone in one direction and only upto 180°. For example- elbow joint.
- Pivot joint- One bone can rotate on the rounded surface of other in many planes. For example joint between skull and first vertebra.
- Gliding joint- These joints allow sideways as well as forward and backwards movements.
- Saddle joints- It is an imperfect ball and socket joint in which one bone is movable on the other fixed in many directions. For example-thumb joint.

Model Test Paper-2

- A.** 1. (c) 2. (b) 3. (c) 4. (c)
- B.** 1. 1000 2. artificial 3. solar cell
4. north south
- C.** 1. T 2. F 3. F 4. F
- D.** 1. (e) 2. (a) 3. (b) 4. (c)
5. (d)
- E.** 1. Multiples are necessary for measuring large quantities. sub multiples are necessary for measuring smaller quantities.

2.

Conductors	Insulators
<ul style="list-style-type: none"> • Allows electricity to pass through them. • For Example- water. 	<ul style="list-style-type: none"> • Does not allow electricity to pass through them. • For Example- Wood.

3. Importance of air:

- Air helps in breathing.
 - Air is used for burning fuels.
 - Air is used for inflating ballons.
- F.** 1. Iron rod can be magnetized by placing it near the magnet as far as the magnet is connected it will produce magnetism and if the magnet is removed it will not show magnetism.
2. Factors that contribute to lowering of the water table are:
- Waste from our homes and factories are dumped in water bodies.
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3. Soak pit is a pit in the ground filled with pebbles or brick pieces. Sewage flow into the soak pit through the pipes. The water is drained in the ground.