

**Amazing  
Science  
Class - 6**

## 1. Sources of Food

### P.11: Quick Review

- (a) cereals (b) sunlight  
(c) pisciculture (d) six
- (a) True (b) True  
(c) False (d) True  
(e) True

### P.13: Quick Review

- (a) scavengers  
(b) omnivores; plants and animals  
(c) whole  
(d) teeth, beak
- (a) True (b) False  
(c) False (d) True

### Time to Review

- A. 1. (a), 2. (c), 3. (a), 4. (c), 5. (c)
- B. 1. herbivores 2. spices  
3. sugar cane 4. animals  
5. honey 6. tomato  
7. photosynthesis 8. bear and crow
- C. 1. We eat food to get energy.  
2. We get milk from cows, buffaloes, goats and camels.  
3. We get fruits, vegetables, spices and sugar from plants.  
4. We get milk, meat, eggs and honey from animals.  
5. Herbivores eat plants whereas carnivores eat flesh of animals.  
6. The animals which live on or in other animal's bodies and drive their food from them are called parasites.  
Examples: lice and bugs  
7. The breeding, rearing, and transplantation of fish by artificial means is called pisciculture.
- D. 1. India is a big country having variation in climatic conditions. So people living in different parts of India have variation in their diets. They eat food that suits their climate.  
2. Milk contains many nutrients. It is good for people of all age. For this reason milk is considered a perfect food. It is used for making many things such as butter, ghee, curd, ice cream, and chocolate.

- Sugar cane is a grass, which grows up to the height of 2.5 m. Its juice is used to make sugar and jaggery which is an important part of our food. In India sugar is consumed in many ways specially in sweets.
- Scavengers eat dead and decayed animals. This way they help in keeping the environment clean. So they are very important.
- Green plants are producers, that is, they make their own food with the help of carbon dioxide and water in the presence of sunlight. Animals do not make their own food. They consume food prepared by plants. So animals are called consumers.
- Spices are plant parts. They add flavour and make the food tasty. So we add them to our food.

### HOT Questions

- Green plants are called producers. They make their own food and store extra food in their parts. This stored food is consumed by herbivores and omnivores. Herbivores are eaten by carnivores and omnivores. This way green plants are the main source of food.
- Food habits of people depend on the geographical features of the area in which they live. For example, people living in coastal areas consume sea food which is easily available. People living in plains are involved in agriculture. They domesticate milch animals. So they consume milk and milk product in large amount.
- Land of Panjab and Haryana is fertile. Most people do agriculture. They domesticate cows and buffaloes to get milk. So they consume milk in large quantity.

## 2. Components of Food

### P.20: Quick Review

- (a) skin (b) proteins  
(c) calcium (d) proteins
- (a) True (b) False  
(c) True (d) True

### P.23: Quick Review

- (a) carbohydrates (b) proteins  
(c) vitamin B<sub>1</sub>
- (a) False (b) True  
(c) False



causes the body overweight. Hence, we should avoid eating too much fats.

### HOTS Questions

1. Proteins are required for the growth and development of the body. An old person's body does not grow, but a body grows. hence an old person needs young person's lesser proteins than a young person.
2. A player do more physical work than a person who works in an office. So a player needs more carbohydrates than the person working in an office.
3. Lack of access to highly nutritious foods, especially in the present context of rising food prices, is a common cause of malnutrition. Poor feeding practices, such as inadequate breast-feeding, offering the wrong foods, and not ensuring that the child gets enough nutritious food, contribute to malnutrition.
4. The average elderly person is in negative calcium balance and accordingly is losing bone mass.

### 3. Separation of Substances

#### P. 31: Quick Review

1. (a) threshing (b) grains, stalk  
(c) filtrate (d) residue  
(e) settle
2. (a) False (b) False  
(c) False (d) False  
(e) True (f) False  
(g) False

#### P. 32: Quick Review

1. (a) solute (b) solution, dissolves  
(c) increases
2. False

#### Time to Review

- A. 1. (b), 2. (c), 3. (b), 4. (c), 5. (b), 6. (a), 7. (b), 8. (d)
- B. 1. Distillation  
2. Sedimentation and decantation  
3. Separating funnel  
4. Winnowing  
5. Sieving  
6. Separating funnel  
7. Evaporation  
8. Evaporation

- C. 1. Pebbles and grains  
2. Salt and water  
3. Alcohol and water  
4. Carbon dioxide and water  
5. Alcohol and water  
6. Water and oil  
7. Air
- D. 1. A combination of different things in which the components are individually distinct is called a mixture.  
2. Filtration is used to separate tea leaves from decoction.  
3. Size of pebbles is used to separate them by hand-picking.  
4. A solution in which no more solute can be dissolved at a given temperature is called a saturated solution.  
5. By the method of evaporation and condensation  
6. By increasing the temperature of the content  
7. (a) Blood, milk and honey are examples of homogeneous mixtures.  
(b) Dust in air, muddy water and sand in water are examples of heterogeneous mixtures.
8. To remove undesirable components and To get desirable component
- E. 1. Winnowing is a method to separate grains from chaff.

In this method, The mixture of grains and chaff is allowed to fall from a height. The wind carries chaff away and the grains fall vertically down to the ground. This way both chaff and grains make their heaps separately.

2. The method of sedimentation and decantation is used to separate an insoluble solid from a liquid, for example, muddy water.

The muddy water is taken into a vessel and left undisturbed. The mud being heavier settles down at the bottom of the vessel. Clear liquid, which forms a layer above the mud, is poured into another vessel.

3. Filtration is a method used to separate an insoluble component from a liquid.

This method is used to separate tea leaves from tea decoction.

It is also used to separate porridge from cooked rice.

4. The process in which a liquid changes into its vapour is called evaporation.

Heat, wind and humidity are the factors that affect the rate of evaporation.

5. Threshing is the method of separating grains from stalks. It is the step in grain preparation after harvesting and before winnowing, which separates the stalks from the grain. Threshing does not remove the chaff or husk from the grain.

For example, wheat crop is harvested and the bundles of stalks are made. The stalks are beaten on a plank or a stone to free the grains.

6. The mixture of chalk powder and salt is dissolved in water in a vessel. The chalk powder does not dissolved in water. So it is separated by filtration. It remains on the filter paper as residue. Now heat the salt solution. Water evaporates leaving behind the salt.

7. The minor component which is dissolved in a liquid is called solute. The liquid in which solute is dissolved is called solvent. The homogeneous mixture of solute and solvent is called solution. For example, in salt solution, the salt is solute, water is solvent.

8. The maximum amount of a solute that can be dissolved in the given quantity of a solvent at room temperature is called its solubility.

To prepare a sugar saturated solution of sugar we take a measured quantity of water and add sugar to it till no more of it is dissolved. The resultant solution is the saturated solution of sugar.

- D. 1. The alum helps to settle down solid fine particles easily. So this process is called loading.
2. Water being heavier than oil forms the lower layer and oil forms the upper layer.
3. Since distilled water is the purest form of water, so it is used in medicine. Pure water maintains the quality of the medicine.
4. River water does not contain salts. So we cannot use it to get salt.

## 4. Fibre to Fabric

### P.40: Quick Review

1. (a) protect (b) weaving  
(c) Clothes
2. (a) True (b) False  
(c) False

### P.42: Quick Review

1. (a) coconut husk (b) Black  
(c) moderate (d) stems
2. (a) False (b) True  
(c) False (d) True

### P.44: Quick Review

1. (a) moisture (b) fleece  
(c) three days (d) Silk
2. (a) False (b) False  
(c) True (d) False

### P.45: Quick Review

1. (a) cheaper (b) fleece  
(b) light weight and strong  
(c) wash and wear
2. (a) False (b) False  
(c) False

### Time to Review

- A. 1. (b), 2. (a), 3. (c), 4. (a), 5. (c)
- B. 1. Clothes protect us against harsh climatic conditions and make us look smart.
2. A natural or artificial filament that may be spun into yarn is called fibre.
3. Wool, cotton, hemp, silk, jute and coir are natural fibres.  
Nylon and polyester are artificial fibres.
4. Cotton is obtained from the flower which grows into a boll  
Jute is obtained from the stems of the jute plant.
5. Synthetic fibres are made by human beings whereas natural fibres are taken from plants and animals. Synthetic fibres are cheaper than natural fibres.
6. Coir is obtained from the husk of coconut.
7. Cocoon is a silky case spun by the larva for protection as pupa.

8. Cotton is a good absorber of moisture whereas synthetic fibre does not absorb moisture.

Cotton does not burn so rapidly as synthetic fibre.

Cotton is not prone to heat damage.

- C. 1. The fibres that are obtained from plants and animals are called natural fibres.

Wool, cotton and silk are well-known natural fibres.

Wool is obtained from the fleece of some animals such as goats and sheep. The best quality wool is obtained from sheep.

Cotton is obtained from the cotton plants. The flower of cotton plant grows into a fluffy and soft fibre.

Silk is obtained from the cocoon spun by the silkworm around its body.

2. (a) Polyester is used in clothing and bedding  
(b) Rayon is used to make carpets, hosiery, ropes and tyres.  
(c) Acrylic is used to weave sweaters.
3. (a) Spinning—The process of making yarn by twisting together fibres is called spinning. After the raw fibre has been cleaned, it is arranged into matted sheets of uniform size. These sheets go to the carding machine which spin them to yarn.  
(b) Weaving—This is the process of making cloth by crossing two sets of yarn over and under each other. It is done on looms. The looms are either hand-operated or power-operated.

4. **Ginning:** It is the process of separating fibre from seeds. After maturing, the balls burst open and the seeds covered with cotton fibres can be seen. From these balls cotton is picked by hand. The fibre is then dried and clean.

**Spinning:** It is the process of making yarn by twisting together fibres is called spinning. After the raw cotton has been cleaned, it is arranged into matted sheets of uniform size. These sheets are called laps, which further go to the carding machine.

**Weaving:** It is the process of making cloth by crossing two sets of yarn over and under

each other is called weaving. The weaving is done on looms. The looms are either hand-operated or power-operated.

5. Jute is a fibre that we get from jute plants. The full-grown plants are uprooted and tied up in bundles. These bundles are immersed in water for a few days. The plants rot and the fibre is separated by hand.

Jute fibre is used to make ropes, mats, bags and sacks.

6. Knitting is the process through which the yarn is turned into knitted fabric by joining consecutive rows of loops. It is done either by hand or a machine.

7. We get silk fibre from the cocoons of the silkworms, usually the caterpillars of a moth called *Bombyx mori*. The caterpillar feed on the leaves of mulberry trees.

The female moth lays eggs on mulberry leaves, and dies soon after laying eggs. The eggs hatch into tiny silkworms, which when fully grown, spin a net or web to hold itself to a twig or stem. The silkworms then forms cocoons, which is silk. After about three days of spinning, the cocoons are completed. This stage of the moth is called pupa. The pupa is killed by placing the cocoon in hot water. After the pupa has been killed, the silk fibre is taken from the cocoon.

Silk is a strong and shiny fibre, and because of its quality it is usually called the queen of fibres.

Silk is used in making fashionable clothing. It is also used in making curtains.

- D. 1. Cotton has the property of absorbing moisture, therefore, it is used in summer to absorb sweat from the body.  
2. Jute requires heavy rainfall, warm and humid climate. It is grown well in clay. These requirements are met in the states of West Bengal and Bihar.  
3. Wool retains heat because of its fluffiness. That is why we do not wear woollen clothes in summer.  
4. Silk is strong and shiny fibre. These characteristics make it the queen of fibres.

E. 1. Cotton is a plant fibre whereas wool is a animal fibre. Cotton has comparatively finer threads and so can be made into finer cloth, such as linen. Wool is more coarse and, it is like wet hair when it gets wet.

Cotton generally produces a short flat twisting fibre which is stronger when wet and also keeps the wearer cool. Wool is a hollow and so it has great insulating qualities. It keeps the wearer warm.

2. Knitting is a method that is used to produce fabric, by turning yarn into cloth. Knitted fabric consists of consecutive rows of loops, called stitches. Each stitch is produced by pulling a new loop through and existing loop. Knitting can be done by hand or a knitting machine.

In weaving, fabrics are produced by interlacing two different sets of yarn or threads horizontally or vertically. Weaving is usually done on a loom, either machine or hand. The loom is used to hold the warp threads in place while weft threads are woven through them. The way the threads are interlaced is known as the weave.

3. Natural fibres are derived from plants and animals, whereas synthetic fibres are almost entirely man made. Fabrics made of natural fibres are generally more comfortable than synthetic ones. Natural fibres are expensive compared to synthetic fibres. Natural fibres have limited usage when compared to synthetic fibres. Natural fibres are biodegradable hence environmentally friendly, unlike synthetic fibres.

### HOTS Questions

1. Coir is a plant fibre which is obtained from the husk of coconut fruit. It is rough and thick fibre, which cannot be used for clothing. It neither absorbs moisture nor acts as an insulator.
2. Many layers trap air, which is a bad conductor of heat. The trapped air acts as insulator and retains the body heat. It does not allow body heat to escape and we feel comfortable during winter.

## 5. Different Kinds of Materials

### P. 52: Quick Review

1. (a) less (b) perceived  
(c) materials (d) motion  
(e) gaseous
2. (a) False (b) False  
(c) False (d) False  
(e) False (f) False

### P. 54: Quick Review

1. (a) yellow (b) greenish  
(c) bad (d) soluble
2. (a) False (b) False  
(c) False (d) False  
(e) True

### Time to Review

- A. 1. (b), 2. (c), 3. (a), 4. (b), 5. (a), 6. (c), 7. (b), 8. (c)
- B. 1. baby, 2. boat, 3. sand, 4. sand
- C. 1. wood and iron  
2. plastic and cement  
3. atom  
4. two hydrogen atoms and one oxygen atom  
5. iron  
6. carbon dioxide and oxygen  
7. sugar and common salt  
8. toys and pots
- D. 1. Grouping things on the basis of certain similarities and dissimilarities is called classification.  
2. Substances that are required to make things are called materials.  
3. Materials—air, tree, wood, iron and glass  
Objects— cupboard, house, bangles, shoes, mug and spoon  
4. Sports and games — tennis, hockey, cricket, football, chess and carom  
Food items — dosa, biscuits, pizza, ice cream, cheese, chocolate and cake  
5. Anything that has mass, occupies space and can be perceived by our senses is called matter.  
Solid, liquid and gas are the three states of matter.  
6. The shine of a material is called lustre. Metals such as gold and aluminium have lustre.  
7. Oxygen and carbon dioxide are soluble in water.  
Oxygen is essential to stay alive. Carbon dioxide is used by green plants to make their own food.

8. See answer to question 6.
- E. 1. Conductors allow heat and electricity to pass through them whereas insulators do not allow heat and light to pass through them.
2. Placing and sorting things based on their similarity is called grouping.

Grouping things makes it easier to find them when need arises. For example, in a chemical shop, medicines are grouped in different columns according to the diseases they are used for.

3.

Property	Solid	Liquid	Gas
Shape	Definite	Not Definite	Not definite
Volume	Definite	Definite	Not definite
Weight	Definite	Definite	Not definite
Compressibility	No	High	Very High

4. See activities 3 and 4, on page 57.
5. The substances which dissolve in given liquid are called soluble substance while those which do not dissolve are called insoluble substances. For example, sugar and salt are soluble in water, while wood and plastics are insoluble in water.
6. Transparent materials— Light can pass through such materials.  
 Translucent materials— Light can partly pass through these materials.  
 Opaque materials— Light cannot pass through such materials.

### HOTS Questions

- Plastic is a bad conductor of heat and electricity. So it protects against an electric shock and heat.
- Electric current passes through water. If we touch an electric appliance with wet hands, we may receive an electric shock.
- Iron or steal.

## 6. Changes Around Us

### P. 62: Quick Review

- (a) law  
(b) causes  
(c) slow and irreversible  
(d) slow and irreversible
- (a) True (b) False

(c) False

### P. 64: Quick Review

- (a) chemical (b) physical  
(c) chemical (d) chemical
- (a) False (b) False  
(c) True (d) False

### Time to Review

- A. 1. (a), 2. (c), 3. (b), 4. (b), 5. (b), 6. (c), 7. (b), 8. (c)
- B. 1. moon 2. chemical  
 3. mimosa 4. iron oxide  
 5. curd  
 6. (a) reversible, (b) reversible, (c) reversible, (d) irreversible
- C. 1. A slow change takes time, for example, growth of a plant into a big tree.  
 2. Melting of ice and melting of wax are reversible changes.  
 3. Curdling of milk and burning of paper are irreversible changes.  
 4. A change in which no new substance is formed is called a physical change. For example, melting of ice is a physical change.  
 5. In rusting iron changes into a new substance called iron oxide.  
 6. Tearing of paper is a physical change whereas burning of paper is a chemical change.
- D. 1. Characteristics of physical changes:  
 (a) No new substance is formed.  
 (b) It is a temporary change.  
 (c) Mass of the substance remains almost same.  
 (d) Neither energy is gained nor it is lost.
2. Characteristics of chemical changes:  
 (a) New substances are formed.  
 (b) It is a permanent change.  
 (c) Chemical composition of the substance is changed.  
 (d) It is accompanied by energy change.
3. Telephone and electric wires, which are made of metals, sag a little during summer and become tight during winter. This shows that substances expand on heating and contract on cooling.
4. When we heat a substance, its particles

gain energy and move far away. This causes gaps between them. This space is taken by the particles of the solute. So, the solubility of a substance increases with increasing temperature.

5. Physical changes are temporary and no new substances are formed. Only physical properties are changed during this change. When the cause of the change is removed, the substance tries to regain original physical properties.
- D. 1. When ice melts, it changes to water, which on cooling changes to ice. So it is a physical change.
2. When an incense burns, new substances such as smoke is formed with the liberation of heat energy, which cannot be changed back into an incense. So, it is a chemical change.
  3. When a wax candle is burnt most of the wax changes into smoke and some other gases, which are new substances. So, it is a chemical change.
  4. A plant takes many years to be fully grown. Trees and bushes grow throughout their life. So growth in plants is a slow change.
  5. When we add curd to lukewarm milk, it does not change immediately to curd. But, it takes many hours. So, it is a slow change
  6. Explosion of fireworks happens immediately as the fireworks come in contact with the fire. So, it is a fast change.

### HOTS Questions

1. Materials expand on heating and contract on cooling. When a hot glass tumbler comes in contact with heat, it gets expanded. As it comes in contact with cold water, it tries to regain its original shape. For this it needs time, but it happens quickly. So the tumbler cracks.
2. This is because that during winter when the wires contract, they could not break apart.
3. Rails are made up of iron. Solids expand on heating. During summer rails expand, so gap is left between them so that they could not bend.
4. When a wax candle is burnt, most of the wax changes into smoke and some other gases,

which are new substances. So it is a chemical change. But some of the wax is left, which is not a new substance. So, burning of a wax candle is simultaneously a chemical change and a physical change.

## 7. Things Around Us

### P.74: Quick Review

1. (a) microorganisms (b) gills  
(c) energy (d) stimulus  
(e) clean
2. (a) False (b) False  
(c) False (d) False  
(e) True

### P.77: Quick Review

1. (a) producers (b) biotic  
(c) water (d) evaporation  
(e) nutrients
2. (a) True (b) False  
(c) True (d) False  
(e) True

### P.81: Quick Review

1. (a) different (b) lotic  
(c) two (d) 20°C to 34°C
2. (a) True (b) False  
(c) True (d) False

### P.86: Quick Review

1. (a) xerophytes (b) large  
(c) cone-shaped (d) brown  
(e) fur (f) warm
2. (a) True (b) False  
(c) True (d) False  
(e) True

### Time to Review

- A. 1. (d), 2. (c), 3. (b), 4. (c), 5. (a), 6. (c), 7. (c), 8. (b), 9. (b), 10. (d)
- B. 1. cell membrane, nucleus and cytoplasm  
2. habitat 3. xerophytes  
4. spruce 5. moist skin  
6. autotrophs 7. parasites  
8. lungs 9. cell
- C. 1. Cell is the basic structural unit of life.  
2. A unicellular organism consists of only one cell whereas a multicellular organism consists of more than one cell.

3. The period from birth to death of an organism is called its life span.
  4. Animals move in search of food and to escape their enemies.
  5. A change in the immediate environment of an organism that influences its activities is called stimulus.
  6. The webbed feet of the frog act like oars to help it swimming.
  7. Living and non-living things together in the surroundings form the environment of an organism.
  8. Sunlight provides energy to all living organisms. It is the main source of energy on the earth.
  9. The chameleon changes its body colour according to the colour of leaves.
  10. Birds have a streamlined body that help to cut through the air. They have wings to fly. Birds have hollow bones that make them light.
- D. 1. The presence of specific features or certain habits, which enable a living organism to live in its surroundings, is called adaptation:
- Deer have strong and thin legs to run fast which help them to protect from predators like cheetah, lions and leopards. Their long ears help them to hear the movement of predators. They have eyes on the sides of their head so that they can see in all directions to avoid danger.
2. All living organisms are found mainly in three types of habitats: aquatic habitat, terrestrial habitat and aerial habitat.
- Organisms that live in water are called aquatic organisms. Water provides habitat to many organisms, such as fish, dolphins, fishes, and many types of aquatic plants.
- The organisms that live in or on the land are called terrestrial organisms. A great variety of organisms are terrestrial.
- Birds and some insects are adapted to live in air. They spend most of their time in air or on the branches of trees.
3. The leaves of cacti are reduced to spines or thorns to minimize water loss through transpiration. They have thick, fleshy and green stems to store water and to perform photosynthesis.
4. The camel's long eyelashes and hair in the ears protect eyes and ears from dusty storms. Its hooves are covered with a large sole which makes the camel walk on sand without sinking. The hump on the back of the camel stores fats which are used in time of shortage. The camel can stay without water for a long time.
  5. The polar bear has white thick fur on its body to protect from cold and to match with the snow. Its padded feet help it to walk on the snow.
  6. Some aquatic plants have air-spaces that help them to float. Submerged plants have long and narrow leaves to withstand water current without getting damaged. Floating plants, which do not have roots, absorb water and minerals through the leaf surface.
  7. Most of the plants growing on mountains are tall and straight. They are cone-shaped and have sloping branches and needle-like leaves. These features help the trees to slide off snow easily.
  8. Grasslands where lions live have brown grass most of the time. Lions also have brown coat, which help them hide in the grasslands when they hunt other animals. They have eyes in front of the face to allow the lions to have correct idea of the location of the prey. Lions also have strong claws that can be withstand inside their toes. This helps them creep up to the prey without making any sound while hunting.
  9. Most of the aquatic animals, except dolphins and whales, breathe through gills. They have fins and flippers that help them in swimming. The tail helps the aquatic animals to change direction. The streamlined bodies help the aquatic animals to cut through water easily reducing the resistance of flowing water. Bodies of aquatic animals have scales which are waterproof. The webbed feet helps the animals swim easily as these work as oars.
  10. Decomposers help in disposing of decayed

animal and plant bodies. This way decomposers clean the environment and create space for living of new generation of organisms.

Decomposers break the complex organic substance into simpler substances. The dead parts are broken down into minerals that mixed up with the soil. These minerals are taken up from the soil by the plants.

11. The main characteristics of living things are:

- (a) Living things are made up of cells, the smallest structural unit of life.
- (b) Living things eat food to get energy to perform various internal and external functions of the body.
- (c) Living things move in search of food and to escape their enemies.
- (d) Living things grow in their size.
- (e) Living things take birth and live for a definite period.
- (f) Living things respond to changes in their immediate environment.
- (g) Living things reproduce to continue their species.
- (h) Living things respire to get the energy from the food they eat.
- (i) Living things excrete waste products produced by some internal processes of the body.

12. The process by which living things produce their own kind to continue their species is called reproduction. Different living things reproduce in different ways. Mammals and humans give birth to their young ones. Birds lay eggs that hatch into chicks. Reptiles, amphibians, insects and most fish lay eggs, which hatch into young ones.

Some plants produce seeds that grow into new plants. Some plants produce seed-like structures called spores, which grow into new plants. Other grow vegetatively.

- E. 1. Xerophytes grow in deserts where there is scarcity of water. So plants growing in deserts reduce their leaves to spine to reduce water loss from them by the process of transpiration.
2. Mesophytes that grow in plains have

moderate conditions of temperature and water. So their leaves do not need to reduce to spine or needle-like structure. They grow to their full growth.

3. Fish live in water. Gills help them to absorb oxygen dissolved in water. Fins help the fishes to swim and change direction in water.
4. Frogs do not have gills. They can live both on land and in water. On land they breathe through lungs and in water they breathe through their moist skin.
5. This is because that leaves may float on the surface of water. Leaves have stomata on the upper surface to breathe.
6. Living in groups confuses predators to decide which one to attack.
7. Long ears help the animals detect any danger around them. Long ears help the animals to keep the body cool.
8. Deer have eyes on the sides of their head so that they can see in all directions to avoid danger.

### HOTS Questions

1. In a habitat, the number of herbivores should be more because they eat grass. Since carnivores eat herbivores, if their number is more they would die with hunger.
2. Only those animals which have gills breathe oxygen dissolved in water. Whales and dolphins are mammals. They breathe through their lungs.
3. Camels excrete wastes in the form of hard pellets because this prevents the loss of water from the body.
4. Tadpoles hatch from frogs' eggs and can only survive in water. As they undergo metamorphosis to become adult frogs they change in many ways, losing their swimming tails and developing legs. Both need to take in oxygen from their environment, and the way they respire also changes as they develop. Tadpoles use gills to breathe. As tadpoles mature the gills are absorbed by the body as other respiratory systems develop.

## 8. Getting to Know Plants

### P. 91: Quick Review

1. (a) 3 (b) watermelon  
(c) shrubs (d) trunk
2. (a) True (b) False  
(c) False (d) True

**P.94: Quick Review**

1. (a) stem (b) animals  
(c) stem (d) anchor  
(e) spines
2. (a) False (b) False  
(c) True (d) True

**P.97: Quick Review**

1. (a) corolla (b) ovary  
(c) ovule (d) lamina  
(e) petals
2. (a) False (b) True  
(c) False (d) False  
(e) True

**P.98: Quick Review**

1. (a) ovary (b) ripened  
(c) embryo (d) climbers
2. (a) False (b) True  
(c) False

**Time to Review**

A. 1. (c), 2. (a), 3. (a), 4. (c), 5. (c), 6. (c), 7. (b), 8. (a)

- B. 1. venation 2. transpiration  
3. compound 4. reticulate venation  
5. carpel 6. petiole  
7. corolla 8. stamen  
9. lamina 10. stomata  
11. carrot 12. prickly pear  
13. node 14. internode  
15. calyx

- C. 1. The root absorbs water and minerals from the soil.  
2. The stem holds the plant erect.  
3. The stem conducts water to the leaves.  
4. The number of sepals and petals in a flower is always not same.  
5. In a flower, ovules are dot-like structures.  
6. Grasses have fibrous roots.

- D. 1. Chlorophyll 2. Petals  
3. Stem 4. Stem and branches  
5. Ovary  
6. The flower that does not have stamens and pistils

7. The banyan has prop roots. The prop roots give support to branches of the plant.
  8. The part of a stem from which one or more leaves emerge is called node.
  9. The pattern of veins in a leaf blade is called venation.
  10. Water and carbon dioxide are used by green leaves to make their own food.
- E. 1. The knob-like growth on a plant which develops into a leaf or flower is called a bud.

2. The shoot consists of the stem, branches, leaves, buds, flowers and fruits.
3. Leaves have tiny holes, called stomata, through which the exchange of gases takes place. Leaves takes in carbon dioxide and give out oxygen.
4. The main parts of a leaf are petiole, midrib, lamina, margin and veins.

Roots of a plant absorb water and minerals from the soil.

5. A typical flower has four main parts: sepals, petals, stamens and pistils.

Sepals are the outermost part of the flower which gives protection to the flowers. The petals are colourful. They lie next to the sepals. The stamens are the male organs. The pistils are the female organs of the flower.

6. Thorns are modified leaves of which the main function is to protect the plant. Leaves are also modified to thorns to reduce water loss by transpiration. Cacti and acacia are plants that have thorns.
7. Cacti usually grow in areas of scarcity of water. Their leaves are modified to spine to reduce water loss by transpiration. Their stems are green which do the job of making food for the plant.
8. Trees are tall and woody plants that have woody stems called trunk. Shrubs are also woody plants, but they are not as tall as trees. Their appearance is of a bush.
9. Shrubs have woody stems whereas herbs are usually plants of green, soft and perishable stems.
10. Watermelon creeps along the ground because it has a weak stem. Though the stem of

grapevine is weak but its tendrils help it to climb along a support.

- F. 1. Do it yourself.  
2. Herbaceous stems are not woody. Herbaceous stems are weak, green and perishable whereas woody stems are strong.  
3. Yes, green stems of cacti make food.  
4. Stem keeps the plant erect. It transports water and minerals absorbed by the root to other parts of the plant. It also transports the food prepared by the leaves to all parts. Green stems make food for the plants by the process of photosynthesis.  
5. The main function of the green leaves is to synthesise food for the plant. They also remove excess water in the form of water vapour through the process of transpiration.  
6. Do it yourself.  
7. Do it yourself.  
8. Do it yourself.

### HOTS Questions

1. A neem sapling has green stem, so the boy says it is a herb. But as the sapling grows, the stem changes to a woody stem.
2. It is not same because photosynthesis is a natural process.
3. Brightly coloured petals attract birds and insects for pollination, a process of reproduction in flowering plants.

### Model Test Paper I

- A. 1. (c), 2. (b), 3. (c), 4. (d), 5. (b)  
B.1. omnivore                      2. vitamin D  
3. knitting, weaving      4. translucent  
5. stem  
C. 1. False                      2. False  
3. False                      4. False  
5. False  
D. 1. (d), 2. (c), 3. (a), 4. (e), 5. (b)

For the teacher: Please correct the option (b) as shrub.

- E. 1. Streamlined              2. Decomposers  
3. In stamens              4. Ovary  
5. Goitre

- F. 1. Air and moisture are required by iron to rust. It is a chemical change.  
2. Calcium keeps our teeth and bones strong.  
3. Clothes protect our body from harsh weather conditions and make us to look smart.  
4. The production of silk and the rearing of silkworms for this purpose is called sericulture.  
5. Sieving is a process of separating undesirable solid substances from a mixture. Usually it is used to separate pebbles from grains.
- G. 1. Mixtures are not pure substances. They are formed by mixing two or more pure substances together. When we need pure substances of a mixture, we have to separate them.

2. The two types of roots are: tap roots and fibrous roots.

The main function of roots is to absorb water and minerals from the soil for the plants. Roots also hold the plants to the soil, that is, roots fix the plants to the soil.

3. A physical change is a temporary change whereas a chemical change is a permanent change.

No new substance is formed in a physical change whereas new substances are formed in a chemical change.

4. Vitamins are organic and can be broken down by heat or acid. Minerals are inorganic and hold on to their chemical structure.  
5. Cotton clothes feel cooler in summer, because cotton moves moisture away from the body.

### 9. Movement in Animals

#### P.108: Quick Review

1. (a) brain                      (b) fibrous discs  
(c) floating ribs              (d) bone marrow  
(e) femur                      (f) pelvic girdle  
2. (a) False                      (b) True  
(c) False                      (d) False  
(e) True                      (f) False

#### P.110: Quick Review

1. (a) joint                      (b) ball and socket  
(c) glide                      (d) one-direction  
2. (a) False                      (b) False

- (c) False                      (d) True  
 (e) False                      (f) True  
 (g) True

**P.112: Quick Review**

1. (a) broad                      (b) wings  
 (c) bones                      (d) foot  
 (e) backbone                  (f) backbone
2. (a) False                      (b) False  
 (c) True                        (d) False  
 (e) False

**Time to Review**

- A. 1. (a), 2. (c), 3. (a), 4. (b), 5. (c), 6. (b), 7. (b), 8. (c),  
 9. (b), 10. (b)

For the teacher: Please correct the option (a) of question 1 as jellyfish.

- B. 1. foot                        2. cartilage  
 3. hearts and lungs        4. cranium  
 5. Teeth, food pipe, stomach, small intestine  
 and large intestine  
 6. 206  
 7. shoulder and pelvic girdles  
 8. ligaments  
 9. cockroach  
 10. bladder

- C. 1. (a) Movement and locomotion in all animals  
 are not exactly same.  
 (b) The lower jaw has a movable joint.  
 (c) The bones are harder than cartilage.  
 (d) Bones are able to move by the contraction  
 and relaxation of muscles.

2. Lower jaw bones are movable.  
 3. We would not be able to move our jaw.  
 4. A ball and socket joint is one in which one  
 round bone like a ball fits into another ball  
 which is like a socket. A ball and socket joint  
 give movement in all directions.  
 5. Animals, such as dogs, that have a backbone  
 are called vertebrates.

Animals, such as cockroaches, which do not  
 have a backbone are called invertebrates.

6. The skeleton forms the general framework of  
 the body. It protects the internal organs of the  
 body. The body movement is because of the  
 joints of the skeleton.

7. (a) A joint is a place where two or more bones  
 are attached together by cartilage.

(b) **Immovable joints:** The joints, such as of  
 cranium, that do not show any movement  
 are called immovable joints.

**Movable joints:** The joints, such as of  
 elbow, that show movement are called  
 movable joints.

8. (a) Muscles are tough and elastic tissues  
 which together with bones make the body  
 parts move.

(b) The contraction and relaxation causes the  
 bones of a joint move.

9. (a) The movement from one place to other is  
 called locomotion.

(b) Because of locomotion animals are able to  
 search for their food and to escape from  
 their enemies.

10. The skull protects the delicate organ called  
 the brain. Besides, it gives protection to the  
 eyes, the ears, the nose and tongue. We are  
 able to eat and talk because of the movement  
 of lower jaw, the part of the skull.

- D. 1. Do it by yourself.
2. The cockroach is an insect that have a  
 hard and tough skin over its body, called  
 exoskeleton. The body muscles of the  
 cockroach are attached to the skeleton to  
 facilitate the movement of joints of the body.
3. Birds fly by flapping their wings up and  
 down. Each flapping includes a downstroke  
 and an upstroke. In an upstroke, the bird  
 move forward, downward and backward. In  
 the upstroke, the bird move forward, because  
 the wings rotate and fold partly to let the air  
 slip through.
4. Fish have a streamlined body and fins, which  
 help them to swim in water. The streamlined  
 body cut through the water easily. The tail  
 fins move to the left and to the right to give  
 fish the power to move forward. The swim-  
 bladder keeps the fish float at the right depth  
 in the water. The spine helps the fish curve its  
 body.
5. The snail has a strong muscular organ,  
 called foot, that helps it to move along the  
 ground. The muscles of the foot move in  
 the backward direction to propel the snail

forward. While moving the snail pours out mucous that makes the forward movement easy by reducing friction between the body and the surface.

6. The snake does not have limbs, but has a long backbone, which is very flexible. The muscles are attached to the vertebrae of the backbone. The snake uses these muscles to crawl along the ground. The loops in the body gives the snake a forward push, pressing against the ground.
7. The movable joints in the human body include the hinge joints, the ball and socket joints, the pivot joints, and the gliding joints. A hinge joint allows the bones to move in one direction only as in elbows, knees, fingers and toes.

In a ball and socket joint, one round bone (like a ball) fits into another round bone (like a socket). The ball-like bone rotates into the socket-like bone to give movement in all directions, as in the pelvic and shoulder girdles.

In a pivot joint, one cylindrical bone rotates in a ring of the other bone. This joint is found at the top of the spine where the head is attached. It allows the head to move from side to side and back to forth.

In a gliding joint, one bone glides over the other bone, allowing only limited movement. The gliding joints are found in wrists and ankles.

### **HOTS** Questions

- The elbow has a hinge joint that allows movement only in one direction like a hinge in doors and windows.
- Hollow bone make the birds light. This helps the birds to fly without feeling too much weight.
- A snake's body curves into many loops, which give it a forward push pressing against the surface of the ground.

## **10. Measurement and Motion**

### **P.120: Quick Review**

- (a) physical (b) tip  
(c) 100 (d) kilometres

- (a) False (b) False  
(c) False

### **P.123: Quick Review**

- (a) circular (b) periodic  
(c) translatory (d) periodic
- (a) False (b) False  
(c) False (d) False

### **Time to Review**

- (a), 2. (a), 3. (a), 4. (d), 5. (d), 6. (b), 7. (c), 8. (c), 9. (b), 10. (d)
- rotatory 2. periodic
  - curvilinear 4. curvilinear
  - curvilinear 6. linear
  - revolutionary 8. rotatory
- kilogram 2. 5000
  - 1 mm, 1 cm, 1 m 1 km
  - When the position of a body with respect to another body changes with time, the body is said to be in motion.
  - This is because the cubit is different of different people.
  - Length:m, mass:g, time:second, temperature: K.
  - The quantities that can be measured are called physical quantities.
  - Area, volume and speed are derived quantities.
  - The earth has three kinds of motion: rotation, revolution and periodic. A spinning top has two types of motion: rotatory (around the axis) and rectilinear (along the ground).
- Since the standard units have fixed quantities, therefore, they are accepted by people all over the world. Standard units have fixed measurements.
  - Units in CGS system: length: centimetre, mass: gram and time: second.  
Units in FPS system: length: foot, mass: pond and time: second.
  - An object is said to be in motion when it changes its position with respect to another thing with time.
  - Since the earth moves round the sun in a circular motion, therefore this motion is called revolutionary motion.
  - The motion of an object which repeats after

a regular interval of time is called periodic motion, for example the rotation of the earth on its axis.

E. 1. The comparison of an unknown quantity with some known quantity of the same kind is called measurement. The known quantity is called unit. A measurement has a unit and a number, the unknown quantity has in comparison with the known quantity. For example, a measurement of 5 m means the unknown quantity has five times of the known quantity.

2. Measurement is a daily activity of our life. Everyday we come across many things which we need to measure. We buy vegetables and fruits on the basis of measurement. We pay money for the quantities of things we buy. So measurement is an essential part of our life.

3. In ancient time, people used non-standard units of measurement. They used pebbles to count things. They measured distances with foot and hand spans.

4. Place the scale in contact with the object along its length.

The eye must be positioned in front of and in the line where the measurement is taken.

The end of the scale must not be worn out. The scale should be placed correctly along the length to be measured.

5. We take a thread and tie a knot near one of its end. Place the knot on one of the end of the curved line and press it with the forefinger. Now place the thread along the line till the other end of the line meets. Now measure the length of the thread on the scale. This measure gives the measure of the curved line.

**For the teacher :** Please ask the students to mark points in the book (page 120) at two ends of the curved line as X and Y. Also change the number of questions as 5, 6, 7 and 8 on page 125. This is a printing mistake, that will be carried out in the subsequent edition.

6. We measure the thickness of a book using a scale. Try yourself.

7. A cycle has two motions: rotatory and curvilinear. The wheel of the cycle rotates on

its axle and the wheels on the road moves in a curvilinear motion. The blades of the ceiling fan has only rotatory motion.

8. Yes, a moving body can have two types of motion. For example, the earth has rotatory and revolutionary motions. A spinning top also has two kinds of motions.

F. 1. If an object changes its position with respect of another object with time, it is said to be in motion. If an object does not change its position with respect to another object with time, it is said to be at rest.

2. When an object moves in a straight line, it is said to be in linear motion. If the object moves in a curved line, it is said to be in curvilinear motion.

3. In translatory motion, the object moves in a line, straight or curved. In rotatory motion, the object moves around a fixed point.

4. The motion which repeats in equal intervals of time is called periodic. Non-periodic motion does not repeat after equal intervals of time.

### HOTS Questions.

1. A person sitting in a moving vehicle is in motion with respect to the object outside the vehicle. But it is at rest with respect to the person sitting on the seat next to him.

2. All the three have rotatory motion as they are moving around a fixed point. But the motion of the steering is not periodic. The top moves in a similar manner as the earth moves as both move on their axes.

3. No, Earth has three motions: rotatory, revolutionary and periodic.

4. Elastic tape can be increased in length by stretching, so it will not give accurate length.

## 11. Light, Shadow and Reflection

### P.128: Quick Review

- |               |             |
|---------------|-------------|
| 1. (a) energy | (b) natural |
| (c) luminous  | (d) opaque  |
| 2. (a) False  | (b) False   |
| (c) False     | (d) True    |

### P.131: Quick Review

1. (a) opaque (b) Amavasya  
(c) moon  
(d) source of light; object
2. (a) False (b) False  
(c) False (d) True

### Time to Review

- A. 1. (c), 2. (b), 3. (b), 4. (b), 5. (c), 6. (c), 7. (b), 8. (a),  
9. (c)

- C. 1. The sun and firefly are natural sources of light.  
2. Lamps and candles are two of the artificial sources of light.  
3. No, a shadow cannot be formed in total darkness.  
4. Light is a form of energy that produces the sensation of sight.  
5. A light source, a screens and an opaque object between the light source and the screen, are required for the formation of shadows.  
6. The bouncing back of light from a surface is termed as reflection of light.  
7. A straight line along which light travels is called a ray of light.  
8. The shadow of a translucent object is not as dark as of an opaque object.  
9. The sun is the main source of light on the earth.  
10. No, a screen is required for a shadow to be formed.  
11. No, an image cannot be formed without a screen.

- C. 1. An object that gives out light is called the source of light.  
2. (a) The materials through which light can pass are called transparent materials.  
(b) Those materials which do not allow light to pass through them are called opaque materials.  
3. Rectilinear propagation of light means that light travels in a straight line.  
4. A shadow is formed when an opaque body blocks the path of light. For the formation of a shadow a screen is required.  
5. The bodies that have light of their own are called luminous bodies.  
6. A pinhole camera is a simple camera without

a lens and with a single small aperture, a pinhole – effectively a light-proof box with a small hole in one side. Light from a scene passes through this single point and projects an inverted image on the opposite side of the box.

7. Solar eclipse happens only at new moon or Amavasya, because on this day the sun and the moon are in conjunction as seen from the earth in an alignment.
  8. A shadow is formed when an opaque body blocks the path of light. The shadow of the object is formed on the screen placed behind the object, that is, opposite of the source of the light.
- D. 1. The sun is the main source of light on the earth. This is the light of the sun because of which we are able to see the earth. The earth reflects the sunlight and we are able to see the earth. So, without the sun no one be able to see the earth.  
2. A shadow is always black irrespective of the colour of the object used to make the shadow. The shadow does not show the details of the object.  
The size of a shadow depends on the distance between the object and the source of light.  
3. The bouncing back of light from a surface is called reflection. When a parallel beam of light falls on a regular surface, the whole light falling on the surface is reflected in a definite direction. When a beam of light falls on an irregular surface, the light gets reflected in all direction.  
4. Please see activity 4 on page 135.  
5. Please see table on page 131.  
6. **Solar eclipse:** A solar eclipse occurs on a new moon day, when the sun, the moon and the earth come in a straight line, with the moon in the middle. The moon, being an opaque body blocks the path of the sunlight to reach the earth's surface. So the shadow of the moon falls on the earth's surface. As a result, we are not able to see the sun (total solar eclipse) or its part (partial solar eclipse) from a certain region of the earth. This phenomenon is

called solar eclipse. For diagram, see page 129.

**Lunar eclipse:** A lunar eclipse occurs on a full moon day when the sun, the moon and the earth are in a straight line, with the earth in the middle. The earth being an opaque body blocks the light reaching the moon's surface. The shadow of the earth falls on the moon's surface, and as a result we are not able to see the moon (total lunar eclipse) or its part (partial lunar eclipse) from a certain region of the earth. This phenomenon is called lunar eclipse. For diagram, see page 129.

### HOTS Questions

1. Yes. If we take a dumble with a circular object on one and a rectangular block on the other end. Both ends will give the shadow of their own shape.



2. No.  
3. Yes. A blurred shadow of the object is observed.  
4. During day-night cricket match there are many lights in all a circular way, which form different shadows of players.  
5. The shadow will not change its colour.

## 12. Electricity and Circuits

### P.139: Quick Review

1. (a) electric current (b) source  
(c) battery (d) sunlight  
(e) two
2. (a) False (b) False  
(c) False (d) True  
(e) False

### P.142: Quick Review

1. (a) electric circuit (b) closed  
(c) component (d) switch
2. (a) False (b) False  
(c) True

### Time to Review

- A. 1. (b), 2. (c), 3. (a), 4. (a), 5. (a)
- B. 1. We get electricity at our home from a power station.

2. An electrical cell has two terminals: a positive and a negative.  
3. The thin wire that glows in a bulb is called filament.  
4. No. A fused bulb cannot glow.  
5. A switch is used to break a circuit.  
6. The negative terminal of dry cell is made of zinc.  
7. Air is an insulator of electricity.  
8. A switch is used to start or stop current in a circuit.  
9. The end with a metal cap in a dry cell is called positive terminal.  
10. No, the current in a dry cell cannot give an electric shock.

- C. 1. Electric circuit is a closed path in which the current flows from positive to negative terminal.  
2. A device which is used to produce an electric current is called the source of electricity, for example, a dry cell.  
3. The dry cell, battery and solar panel are sources of electric current.  
4. A open circuit is not a complete circuit, so the bulb does not glow.  
5. The dry cell is required to start the flow of current in the circuit. In our home this start is given by the mains.  
6. A switch is used to break the electric circuit.  
7. An electric circuit is closed when the switch is on.  
8. Copper is a good conductor of electricity, so it is used in electric circuits.  
9. Metals are good conductor of electricity and plastic is an insulator of electricity. So to avoid an electric shock, metal wires are covered with plastic.
- D. 1. Draw the diagram by yourself.

**Working of a dry cell:** A dry cell has two terminals marked positive and negative. When these terminals are connected through a metal wire, an electric charge begins to flow in the wire constituting an electric current. The electric current is produced from the reaction of the chemicals inside the cell. When the chemicals are used up, the cell

stops producing electric current.

2. Do it by yourself. See diagram 12.12 on page 142 of the textbook.
3. See diagram 12.6 on page 140 of the textbook.
4. (a) The materials that allow an electric current to pass through them are called conductors, for example, metals such as iron, copper, silver and gold. The materials that do not allow an electric current to pass through them are called insulators, for example, rubber and plastic.  
(b) An electric circuit is not complete and does not allow the electric current to pass is called an open circuit. A circuit that is complete and allow electric current to pass is called a closed circuit.
5. A switch is a device which is used to break the flow of current in an electric circuit.

Impure water is a conductor of electricity. If we touch a switch in a circuit with wet hands, there is a chance of an electric shock. So we should not touch a switch with wet hands.

6. See the diagram of the torch on page 142 of the textbook.

**Working of a torch:** A torch is used to get light. It consists of a bulb, one or more cells, a switch and a circuit. The cells are connected in series, the positive terminal of one cell is connected to the negative terminal of the other cell. When the switch is on, the current flows through the circuit and the bulb lights up.

7. The handle of the screw drive is made of plastic, which is an insulator. The current is not reaching the bulb, so the bulb is not glowing.
8. It was a conductor.

### HOTS Questions

1. Rubber is an insulator of electric current. So to avoid any electric shock, the electrician wears rubber gloves.
2. See answer above of question 1.
3. In both devices, electric energy is converted to heat energy. Though in a bulb, the electric

current is converted to heat energy and light energy.

## 13. Fun with Magnets

### P.148: Quick Review

1. (a) iron (b) Chinese  
(c) many (d) soft
2. (a) True (b) False

### P.152: Quick Review

1. (a) magnetic (b) non-magnetic  
(c) directions (d) south  
(e) poles (f) repel; attract
2. (a) False (b) False  
(c) False (d) True

### Time to Review

- A. 1. (c), 2. (a), 3. (b), 4. (c), 5. (c), 6. (c), 7. (b)
- B. 1. Lodestone is magnetite in nature.  
2. A magnet has two poles: south pole and north pole.  
3. The Chinese were the first to use magnets in navigation.  
4. A freely suspended magnet rests in north-south direction.  
5. Compass is used to find out directions.  
6. No, the poles of magnet cannot be separated.  
7. Single touch method.  
8. No, a magnetic south pole does not exist without a magnetic north pole.  
9. Heating a magnet loses its magnetism.  
10. Magnetic keepers are the pieces of iron which are used for storing magnets.  
11. Horse-shoe magnets have more magnetic power than natural magnets.  
12. Iron, cobalt and nickle are magnetic materials. Water, phosphorus, plastic, copper, zinc, aluminium, mercury and silver are non-magnetic materials.  
13. Poles of magnet are located at the ends.
- C. 1. Lodestone is a kind of rock found in Asia Minor and Greece, a piece of which when suspended rests in north-south direction.  
2. An object that attracts iron and some other materials is called magnet.  
3. When a piece of load stone is suspended freely, it comes to rest in south-north direction.

4. This is because of the influence of the earth which itself acts as a huge magnet with its south pole near the geographical north pole and north pole near the geographical south pole. It influences all the magnets to align themselves along its north-south direction.
5. The attraction for iron observed in lodestone and a magnet is called magnetism.
6. When similar poles of two magnets brought together, they repel each other. If their opposite poles are brought together, they attract each other.
7. Magnetic poles always exist in pair. So we cannot break a magnet into the north pole and south pole separately, and the magnetic poles always exist in pair.
8. Permanent magnets are formed from iron, nickel or cobalt. They retain their magnetism for a long time.

An electromagnet is formed when an electric current is passed through a conducting wire wound around a piece of soft iron bar; the bar acts like a magnet. But it behaves like a magnet only as long as the wire wound over it carries current.

9. If a magnet is dropped from a height, it can lose its magnetism.
10. A compass is a device which is used to find direction. It is a small box that has a magnetic needle at its centre, which rotates freely.
11. The compass is used to find directions.

**For the teacher :** Numbering of questions is not correct. It is a printing mistake. Please get it corrected.

- D. 1. A permanent magnet retains its magnetism for a long time whereas a temporary magnet retains its magnetism for a short time.
2. Magnets are used to make electric motors and generators.  
Magnets are used to separate magnetic materials from the scrap.  
ATM cards, credit cards and debit cards have a magnetic strip that stores information.
3. See single or double touch method on page 150 of the textbook.

4. The blade of the sharpener is a magnetic material because of which it is attracted towards a magnet.
5. (a) Bar magnets should be kept in pairs with their unlike poles on the same side. They must be separated by a piece of wood and two pieces of soft iron should be placed across their ends.  
(b) For storing shoe-horse magnets, a piece of iron should be kept across the poles.

### HOTS Questions

1. No. They would lose their magnetism.
2. We bring a known pole of a bar magnet near a pole of the horse-shoe. The attraction or repulsion helps us to know the poles of the horse-shoe magnet.
3. Yes, because the needle of compass always points in north-south direction. The position of the sun with respect to the earth changes with the revolution of the earth.
4. Because of the attraction of the earth on the bow.
5. It will be located in geographical south pole.

### 14. Water

#### P.159: Quick Review

1. (a) living beings (b) 70%  
(c) rain (d) impurities
2. (a) False (b) False  
(c) False (d) False

#### P.162: Quick Review

1. (a) solid (b) evaporation  
(c) condensation, important  
(d) dries (e) flood
2. (a) False (b) False  
(c) True (d) False

### Time to Review

- A. 1. (c), 2. (b), 3. (a), 4. (b), 5. (a)
- B. 1. The states of water are: solid (ice), liquid and gaseous (water vapour)
2. Main sources of water are rain, rivers, lakes, pond, seas, oceans and underground water.
3. (a) condensation  
(b) evaporation  
(c) evaporation

- (d) condensation  
(e) evaporation
4. About 97% of total water on earth is found in seas and oceans.
  5. River is one of the sources of fresh water.
  6. Rain harvesting is the method used for collecting and storing rain water for future.
- C. 1. Every organism consists mostly of water. Water plays an important role in various life activities such as digestion, circulation and excretion.
2. (a) The process of changing of water into water vapour is called evaporation.  
(b) The process of changing water vapour to water is called condensation.
  3. The rain water that seeps into the ground and gets collected above a layer of rock is called ground water.
  4. We get underground water by pumps or digging wells.
  5. Rain is the main source of water. Some of the rain water flows in rivers. Some gets collected in lakes and ponds. Some rain water seeps into the ground, which we draw through pumps. The lack of rain affects crops and livestock.
  6. Collecting and storing rain water for future use is called rain water harvesting.
  7. Water is changed to ice by keeping it below 0°C. Water vapour changes to water by the process of condensation.
  8. Water is used for drinking. It is used in agriculture to grow crops.
  9. Evaporation and condensation are the processes responsible for the formation of clouds.
  10. A long period of abnormally low rainfall, especially one that adversely affects growing or living conditions is called drought. During a drought animals either die due to lack of water or shortage of food.
  11. Flood cause death of animals as these are drowned or carried away by the heavy flow of water. Their is a scarcity of fodder for them. If affects the health and increases infections of animals due to the germ produced.
12. The soil becomes dry because it continues to loose water by evaporation and transpiration.
  13. Water conservation involves reducing the usage of water and recycling of waste water for various purposes such as cleaning, irrigation and manufacturing.
- D. 1. Water evaporates from different water bodies due to the heat of the sun. The water vapour rises into the air and condenses to form water droplets. These water droplets collect together to form clouds.
2. The water cycle is a continuous cycle where water evaporates, travels into the air and becomes part of a cloud, falls down to earth as precipitation, and then evaporates again. This repeats again and again in a never-ending cycle. Water keeps moving and changing from a solid to a liquid to a gas, over and over again.
  3. Droughts occur when a long period of abnormally dry weather leads to a severe water shortage. Droughts are also often caused by the activity of humans. Widespread cutting down of trees for fuel reduces the soil's ability to hold water.
  4. Droughts endanger lives and livelihoods through thirst, hunger and the spread of disease. Water supply for irrigation, industrial and personal uses are greatly reduced.
  5. Floods occur most commonly from heavy rainfall when natural watercourses do not have the capacity to convey excess water. However, floods are not always caused by heavy rainfall. Dam failure, triggered for example by an earthquake, will result in flooding of the downstream area, even in dry weather conditions.
  6. Floodwater can seriously disrupt transport by cutting off roads and railway lines, as well as communication links when telephone lines are damaged.  
Floods disrupt normal drainage systems in cities, and sewage spills are common, which represents a serious health hazard, along with standing water and wet materials in the home.

Soil can be eroded by large amounts of fast flowing water, ruining crops, destroying agricultural land, buildings and drowning farm animals.

7. The world is heading towards a water crisis due to excessive and uneconomical use of water by the large human population. Humans waste lots of water while brushing teeth, bathing, washing clothes, etc. Over-use of water has led to dwindling supply of water available for human use. So, we need to conserve water to avoid its crisis.

8. We can conserve water by the following methods:

- (a) Rainwater harvesting
- (b) Building dams
- (c) Preventing water pollution
- (d) Planting new plants

9. Collecting rainwater for later use is called rain water harvesting.

Rainwater harvesting can be done in following two ways:

- (a) By collecting rainwater from rooftops through pipes in storage tanks.
- (b) Allowing water to go into ground directly from the roadside drains that collect rainwater.

10. You know rain is the main source of water. Some of the rainwater seeps into the ground and gets collected over a hard layer of rocks. We draw this water through pipes by pumps. When there is less rain, people draw ground water. So the use of groundwater and less precipitation are the causes of lowering of water table.

### HOTS Questions

1. The air that we breathe out contains water vapour, which changes in water on the spectacle. So the glasses become wet.
2. If water is not recycled, there would be no rain. There would be no water in rivers. There would be no fresh water to drink.
3. Leaves contain lots of water. When they are heated or cooked, their water changes to water vapour and escapes into the air. So they reduce into quantity.

## 15. Air

### P.169: Quick Review

1. (a) see, feel (b) gases  
(c) prevents (d) Oxygen
2. (a) False (b) False  
(c) False (d) False

### P.172: Quick Review

1. (a) oxygen, water (b) fruits and seeds  
(c) many  
(d) rise in temperature of the earth
2. (a) False (b) False  
(c) True

### Time to Review

- A. 1. (a), 2. (d), 3. (a), 4. (c), 5. (b), 6. (b)
- B. 1. Helium 2. Neon  
3. Carbon dioxide 4. Oxygen  
5. Carbon dioxide 6. Oxygen  
7. Please avoid this question
- C. 1. The envelope of air surrounding the earth is called atmosphere.
2. Air is a mixture of many gases. Nitrogen and oxygen are the major constituents of the air. Other gases in the air are carbon dioxide, water vapour, helium and neon.
3. Nitrogen is the major part of the air. About 78% of air by volume is nitrogen. Nitrogen dilutes the oxygen to make it fit for breathing. It is main constituent of proteins which is required by all living organisms for growth.
4. Carbon dioxide is added to the air by burning fuels such as coal, wood, coke, petrol, etc. Because fuels contain carbon. The combustion of these fuels with oxygen liberates carbon dioxide. Animals also breathe out carbon dioxide.
5. The percentage of oxygen in the air is reduced at height. So mountaineers carry oxygen cylinders with them to breathe.
6. Yes, there is air in the soil, which is used by organisms that live in the soil.
7. Humidity is the amount of water vapour in the air. Water vapour is the gaseous state of water and is invisible. Higher humidity reduces the effectiveness of sweating in

cooling the body by reducing the rate of evaporation of moisture from the skin.

8. Fish use a specialized organ called gills to breathe oxygen dissolved in water. The mouth and throat of a fish force water over the gills, which have many blood vessels. The water has a higher concentration of oxygen than the blood. Therefore, the dissolved oxygen from the water moves through the thin walls of the blood vessels and enters the blood.
  9. Plants need nitrogen for their growth. They use nitrogen to produce protein. A plant deficient in nitrogen will show yellowing in the older leaves first due to the underdevelopment or destruction of chloroplasts and an absence of the green pigmented chlorophyll.
  10. The upper portion of the atmosphere contains a layer of ozone gas. This ozone layer prevents harmful rays of the sun from reaching the earth surface. This way the ozone layer protect us from many diseases such as skin cancer.
- D. 1. Air is a mixture of many gases, each of which has its own importance. Oxygen is used for breathing and burning of things. Nitrogen is required by plants to make proteins. Carbon dioxide is used by green leaves and stems to synthesise food. Air in combined form helps in the dispersal of fruits and seeds. It helps in pollination of flowers. Birds fly because of air. Moving air is used to run windmills to generate electricity.
2. Air supports burning. No substance can burn in the absence of air. If you burn a candle and invert a measuring cylinder over the candle, you will observe that the flame of the candle flickers and is put off. This is because the candle did not receive air to burn.
  3. Insects do not breathe the same way that we do. Oxygen enters to insect tissues through tiny openings in the body called spiracles, and then through tiny air-filled tubes called tracheae. Some insects can increase oxygen delivery by a mechanical pumping action of their bodies.

Earthworms acquire oxygen through their

skin. This is why earthworms surface after heavy rains, despite the fact that it is extremely hazardous for them to do so.

4. Carbon dioxide is used by green leaves and stems to make food. Carbon is used to extinguish fire as it does not support burning. It is also used in fizzy drinks like soda water.
5. Motor vehicles contribute to about 60% of air pollution. Combustion of petrol and diesel produces carbon dioxide, carbon monoxide, sulphur dioxide and oxides of nitrogen and sulphur, which pollute the air as they are poisonous in nature.
6. Polluted air contains excess of carbon dioxide, carbon monoxide, sulphur oxide, nitrogen oxide and smog. Excess of carbon dioxide causes suffocation. Its excess in the air rises the temperature of the earth. Carbon monoxide is a poisonous gas. It reduces oxygen-carrying capacity of blood. Sulphur dioxide causes headache, chest constriction, irritation in breathing tract, vomiting, etc. Nitrogen oxide leads to death of some plants. Smog, a mixture of smoke and fog, causes many diseases in humans.
7. Take a glass tumbler filled with cold water or ice cubes. Put the tumbler on a table and observe its outer surface after a few minutes. You will see water droplets on the outer surface of it. Where they have come from? The air contains water vapour. When it comes in contact with a cold surface, it changes to water, which we see on the surface of the tumbler.

### HOTS Questions

1. See answer 7 of detailed questions.
2. Like animals plants also release carbon dioxide. Although during day time this carbon dioxide is used in photosynthesis process and oxygen is released as a produce of photosynthesis. At night photosynthesis does not occur. As a result plants release only carbon dioxide and not oxygen.
3. Skin cancer is caused by the harmful radiation of the sun. The ozone layer help us to protect us from the harmful radiation of the sun. The particular place where people have skin cancer is not protected properly by the ozone layer. This is

because of the hole in ozone layer. that allows sun's radiation to reach the earth.

- Without carbon dioxide green plants would not be able to make their own food. Extra food is stored in different parts of the plants, which is consumed by non-green plants, animals and human beings. So carbon dioxide is very important for the survival of life on the earth.

## 16. Disposal of Waste Materials

### P.180: Quick Review

- (a) biodegradable (b) disposal of waste  
(c) Incineration (d) liquid  
(e) Decomposition
- (a) False (b) False  
(c) True (d) False

### P.182: Quick Review

- (a) solid  
(b) consuming, throwing  
(c) old, new  
(d) resources, pollution
- (a) True (b) False  
(c) False

### Time to Review

- A. 1. (c), 2. (d), 3. (a), 4. (a), 5. (d), 6. (c)
- B. 1. The burning of waste is called incineration.  
2. Compost is very useful for plants.  
3. The liquid waste from kitchen and toilet is called sewage.  
4. The liquid waste is called sewage.  
5. The use of waste material is called reuse.  
6. A rag-picker collects materials that can be recycled.  
7. Paper, plastic, and metal cans can be recycled.  
8. Plastic is a non-biodegradable material.  
9. The solid waste is called refuse.  
10. Carbon dioxide is a gaseous waste.
- C. 1. The substances that can be broken down into useful materials by the action of microorganisms are called biodegradable substances.  
2. The process of getting rid of waste materials or substances is called disposal of waste.  
3. Solid waste can be disposed of by open dumping, sanitary landfills, composting and incineration.

- Solid waste from homes, industries, schools, and agriculture is called refuse.
  - In villages, people use compost pits for the disposal of solid wastes. They throw garbage into the pit and close the pit when it is completely filled. After a few months the garbage converts into compost, which is applied to the soil to increase its fertility.
  - Polythene bags do not decompose. They clog drains and the sewage spreads on streets. The sewage gives foul smells. Polythene bags are also eaten by cows, which may die of it.
  - Burning of solid waste in the open is called incineration. This is not a good method of solid waste disposal.
  - Compost is animal and plant waste, which is decomposed by microorganisms to useful components for the plants.
  - Recycle saves natural resources. It saves landfill space. It also helps to reduce pollution.
  - Open dumping is a process of disposal of solid waste, in which the waste is thrown in open to decay. It is not a proper method of disposal as the decayed material gives foul smell. It also invites animals such as rats and flies that spread diseases in human beings.
- D. 1. A soak pit is used for the temporary collection and storage of faeces, excreta or faecal sludge as part of an on-site sanitation system. The pit is lined with bricks or concrete, covered with a slab. The sewage flows into the soak pit through pipes or drains. The water is absorbed by the ground.
- An sanitary landfill, deep trenches are dug at a place away from residential areas. The waste is dumped into the trenches and covered with soil. The soil prevents insects from getting into the refuse. When the site is filled completely, it is covered for the final time. Then the area can be used for residential or other purposes.
  - Recycling is the method of getting materials from the waste that can be reused. It involves breaking down of old things to make new things. The materials that can be recycled are glass, metals, wood and fibres from paper.

4. The materials that can be decomposed by microbes are called biodegradable materials. They include plant and animal matter. The materials that cannot be decomposed by microbes are called non-biodegradable materials, for example plastics.
5. Many plastic products are difficult to recycle. Recycled products are considered of low quality. So consumers do not readily buy recycled products.
6. Vermicomposting is the process of composting waste materials using various worms, such as earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast. Containing water-soluble nutrients, vermicompost is an excellent, nutrient-rich organic fertilizer and soil conditioner. This process of producing vermicompost is called vermicomposting.
7. In composting, compost pits are prepared in the ground. These pits are filled with waste, usually plant waste. After the pits are filled completely, they are covered with soil. After a few months the waste is decomposed by microbes. This decomposed waste is called compost, which is used to increase soil fertility. For difference between composting and vermicomposting see answer of question 6 above.
8. (a) We can reduce the production of wastes by avoiding the use of polythene bags. This can be used by using cloth, jute or paper bags in place of plastic ones. We can reduce waste by using things judiciously.  
(b) We can give our used things to the needy for use. We can reuse things by recycling the materials.

### HOTS Questions

1. If we burn paper waste, it pollute environment. But if we recycle them, it will save its natural resource, that is tree.
2. Composting is a better method, but is used only for biodegradable materials.
3. Yes, he is a friend. Because he collects waste materials and sold to people who use this material to make new things.
4. We would prefer the dry leaves composting because burning of them would pollute air.
5. Eating in a banana leaf platter is good because the leaves can be changed to compost after use.

### Model Test Paper 2

- A. 1. (b), 2. (b), 3. (d), 4. (d), 5. (b)
- B. 1. movement                      2. terrestrial  
3. linear                                4. light, screen  
5. north-south
- C. 1. False                                2. False  
3. False                                4. False  
5. False
- D. 1. (c), 2. (d), 3. (a), 4. (e), 5. (b)
- E. 1. A ball and socket joint is one in which one round bone like a ball fits into another bone which is like a socket.  
2. Living things eat, breathe, move, grow, feel, reproduce and excrete waste from the body.  
3. A running cycle has linear and rotatory motion. A ceiling fan has only rotatory motion.  
4. The bouncing back of light from a surface is called reflection of light.  
5. Air is composed of many gases such as nitrogen, oxygen, carbon dioxide, water vapour, helium and neon.  
Oxygen is essential for respiration.