

New Science Power 6

Sources of Food

1

ANSWERS

Check Point 1

1. **What is the use of pulses?**

Ans. Pulses provide proteins to the body.

2. **What are cereals?**

Ans. Cereals are seeds of cultivated grasses.

3. **Name two stems which we use as vegetables.**

Ans. Potato and ginger

4. **Name two leafy vegetables.**

Ans. Spinach and cabbage

5. **Give any four examples of dry fruits.**

Ans. Groundnut, walnut, coconut and cashewnut

6. **What is the use of spices in cooking?**

Ans. Spices add taste and aroma to food.

7. **Why do we feel fresh after drinking tea or coffee?**

Ans. Caffeine present in tea and coffee stimulates our nervous system, so we feel fresh after drinking tea or coffee.

Check Point 2

1. **Name any two sea-foods.**

Ans. Fish and prawn.

2. **In what forms are eggs eaten?**

Ans. Eggs are eaten as boiled, fried, poached or omelette.

3. **Name any four milk products.**

Ans. Four milk products are curd, ghee, butter and cheese.

4. What does honey contain?

Ans. Honey contains sugar, minerals and enzymes.

5. Name the three meals you take daily.

Ans. Breakfast, lunch and dinner.

Check Point 3

1. Name two carnivorous animals.

Ans. Two carnivorous animals are lion and tiger.

2. Name two omnivorous animals.

Ans. Two omnivorous animals are crow and sparrow.

3. Name two animals that eat insects.

Ans. Two insect-eating animals are bat and lizard.

4. What are decomposers?

Ans. The organisms such as bacteria and fungi that feed on dead plants and animals are called decomposers.

5. What is cudging?

Ans. The rechewing of half-digested food by animals like cows and buffaloes is called cudging.

PRACTICE TIME

A. MCQs–Choose the correct answers.

1. Snakes swallow their prey as a whole because they have

- | | |
|---------------|---|
| (a) long body | (b) sharp teeth |
| (c) big mouth | (d) movable lower jaw <input checked="" type="checkbox"/> |

2. Fish, prawns and crabs are good sources of

- | | |
|-------------------|---|
| (a) carbohydrates | (b) proteins and iodine <input checked="" type="checkbox"/> |
| (c) fats | (d) minerals |

3. Vegetarians are the people who eat

- | | |
|---|-------------------|
| (a) plant food only <input checked="" type="checkbox"/> | (b) meat only |
| (c) plant food and meat | (d) none of these |

4. Which of these have sugar stored in them?

- | | |
|-----------------------------|--|
| (a) cauliflower and mustard | (b) sugarcane and beetroot <input checked="" type="checkbox"/> |
| (c) cloves and cinnamon | (d) carrot and radish |

5. Lions and tigers have sharp teeth

- | | |
|--|-------------------------|
| (a) to swallow their prey | (b) to gnaw |
| (c) to catch and tear their prey <input checked="" type="checkbox"/> | (d) to grind their prey |

6. Insects, worms and grains are eaten by

- | | |
|---|-----------|
| (a) squirrels | (b) frogs |
| (c) crows <input checked="" type="checkbox"/> | (d) goats |

7. Which of the following is not an omnivore?
 (a) crow (b) human beings (c) hen (d) pig
8. The stem of which of these plants is not used as food?
 (a) potato (b) onion
 (c) ginger (d) spinach
9. Tea and coffee contain a substance called
 (a) caffeine (b) oil
 (c) sugar (d) sprouts

B. Fill in the blanks.

1. Nongreen plants and all animals are called heterotrophs.
2. Garden lizards eat insects.
3. Sugar we use in coffee and tea, and in making sweets comes from sugarcane and beetroot.
4. Cabbage is a leafy vegetable.
5. Bees are reared for honey.
6. Snakes swallow their food as a whole.
7. Tea and coffee contain a substance called caffeine.

C. Answer in one word.

1. The process of making food by green plants. Photosynthesis
2. Rice, maize, bajra are grouped as this. Cereals
3. People who do not eat meat and eggs. Vegetarians
4. The animals which eat dead animals. Scavengers
5. The food items which add taste and aroma to our food. Spices

D. Define these terms.

1. Carnivores

Ans. Animals that eat flesh of other animals are called carnivores.

2. Herbivores

Ans. Animals that eat plants or plant parts are called herbivores.

3. Omnivores

Ans. Animals that eat plants as well as flesh of other animals are called omnivores.

4. Autotrophs

Ans. Organisms which can make their own food from raw materials are called autotrophs. All green plants are autotrophs.

5. Decomposers

Ans. Organisms that feed on dead plants and animals are called decomposers. Fungi and bacteria are decomposers.

6. Heterotrophs

Ans. Organisms which derive their food from plants or animals are called heterotrophs. They are all animals and nongreen plants.

E. Answer these questions.

1. What are the main functions of food?

Ans. Food provides energy; material for growth, reproduction and repair of damaged cells. It keeps us healthy and enables to fight against infections.

2. Write the types of animals on the basis of the food they eat.

Ans. On the basis of the food animals eat, they are herbivores, carnivores and omnivores.

3. Describe the process of cudging.

Ans. The process of rechewing the half-digested food (called cud) by the animals like cows and buffaloes is called cud-chewing or cudging.

4. Name two sources of oil.

Ans. The coconut fruit and seeds of mustard, groundnut, etc., are two sources of oil.

5. Name five spices which we get from plants.

Ans. Cardamom, clove, pepper, turmeric and cinnamon.

6. Which food items add flavour and aroma to our food?

Ans. Spices add flavour and aroma to our food. They are clove, cardamom, pepper, turmeric, cinnamon, coriander, ajwain, hing, jeera, chillies, etc.

7. Why are scavengers called 'nature's cleaners'?

Ans. Scavengers are called 'nature's cleaners' because they clear dead animals by feeding on them.

F. Give reasons for the following.

1. All organisms need food.

Ans. All organisms need food because food provides energy which is required for doing all life activities such as breathing, digestion, excretion, etc. These life activities keep them alive and active.

2. Green plants are called autotrophs.

Ans. Green plants are called autotrophs because they are capable of producing their own food due to presence of green pigment called chlorophyll in them.

3. Sprouts are considered very nutritious.

Ans. Sprouts are very nutritious because they are rich source of proteins and vitamin B complex.

4. Food should be a mixture of different items and not just one item.

Ans. Food should be a mixture of different items because eating different items provides us with all the required nutrients and keeps us healthy and strong.

5. We get milk as well as eggs from animals. But milk is not a nonvegetarian diet.

Ans. Milk is not a nonvegetarian diet because it neither has living cells in it nor is obtained by killing a milk-producing animal.

G. Skill-based questions.

1. Ravi has missed his breakfast today. He is feeling tired and exhausted. Why?

Ans. On missing the breakfast, Ravi's body has not got energy to work and remain active. That is why he is feeling tired and exhausted.

2. Ritika is fond of 'Tandoori Chicken'. But, whenever she visits a vegetarian restaurant, she never misses to place the order for 'Shahi Paneer'. Is Ritika a carnivore or omnivore? Justify.

Ans. Ritika is an omnivore because she eats both vegetarian and nonvegetarian foods.

3. Why is honey used as medicine also?

Ans. Honey is used as medicine also because it has antibacterial properties.

4. Why is our country facing food problem? How can it be solved?

Ans. Our country is facing food problem due to huge population. This problem can be solved by proper management of food resources and putting a check on population growth.

5. Why is carrot red and spinach green?

Ans. The carrot is red due to the presence of a red-coloured pigment called beta-carotene and spinach is green due to the presence of green chlorophyll.

H. Activity/Project-Do as directed.

Prepare a diet chart to provide balance diet to a twelve-year old child. Remember, the suggested food items should not be expensive and should be commonly available in your area.

Ans. Do it yourself.

Think Zone

1. Fish-eating is more common in coastal states like West Bengal, Odisha, Kerala, Tamil Nadu and Andhra Pradesh. Why?

Ans. In coastal states, fish is easily available and hence, fish-eating is more common there.

2. We Indians are very fond of preparing and eating delicious foods. Find out more about the following regional food items of India. Try to correlate the areas to these food items.

Biryani Kahva Sambhar Litti-chokha Payasam Srikhand Rasam Dhokla Sondesh

| | | | |
|--------------|------------------|--------------|---------------|
| Ans. Biryani | - Andhra Pradesh | Kahva | - Kashmir |
| Sambhar | - South India | Litti-chokha | - Bihar |
| Payasam | - South India | Srikhand | - Maharashtra |
| Rasam | - Tamil Nadu | Dhokla | - Gujarat |
| Sondesh | - West Bengal | | |

ANSWERS**Check Point 1**

1. Name two energy-giving components of food.

Ans. Carbohydrates and fats

2. Which are the three types of carbohydrates?

Ans. Sugars, starch and cellulose

3. Name two sources each of sugar and starch.

Ans. **Sugar:** Honey and jaggery; **Starch:** Wheat and maize

4. What is known as instant source of energy?

Ans. Glucose

5. What is the role of dietary fibres?

Ans. Dietary fibres help in bowel movement, keep the intestines clean and prevent constipation.

Check Point 2

1. List two food items rich in saturated fats.

Ans. Cheese and ghee

2. Why should we avoid eating animal fats?

Ans. Animal fats contain cholesterol. Excess of cholesterol gets deposited on the walls of blood vessels and makes them narrower. This leads to heart diseases like heart attack.

3. Which of the two gives us more energy – carbohydrates or fats?

Ans. Fats give us more energy as compared to carbohydrates.

4. How much fat is essential in our daily diet?

Ans. 60-70 grams for males, 50-55 grams for females.

5. Are fats obtained from plants good or bad? Why?

Ans. Fats obtained from plants are good because they are unsaturated and do not contain cholesterol.

6. Doctors often advise to eat less fried food. Explain why?

Ans. Fried food contains too much fat which can lead to increase in cholesterol in the body. The cholesterol gets deposited on the walls of our blood vessels and makes them narrower. This may lead to heart attack.

Check Point 3

Fill in the blanks.

1. Our body needs proteins to make new cells.
2. The total requirement of proteins for an adult is 65-75 grams per day.
3. Proteins are made up of smaller units called amino acids.
4. Proteins are mainly made up of carbon, hydrogen, oxygen and nitrogen.

Check Point 4

1. Name the protein present in the blood. What is its role in the body?

Ans. Haemoglobin. It carries oxygen from lungs to the cells and carbon dioxide from the cells to the lungs.

2. Which of the following components gives more energy?

- (a) carbohydrates (b) fats (c) proteins

Ans. (b) fats

3. Which vitamin maintains normal vision?

Ans. Vitamin A

4. Name the vitamin our body can produce in sunlight.

Ans. Vitamin D

5. Name the disease caused by the deficiency of

- (a) iodine (b) calcium (c) vitamin D

Ans. (a) Iodine–Goitre (b) Calcium–Rickets in children and Osteoporosis in adults
(c) Vitamin D–Rickets

6. Name the major component of roughage. What are its benefits to our body?

Ans. Cellulose. It helps in the retention of water and easy digestion of food by adding bulk to the food. It also helps in regular movement of bowel and thus, prevents constipation.

7. Which of the following is more essential to our body?

- (a) water (b) food (c) vegetables

Ans. (a) water

Check Point 5

1. What is a diet?

Ans. The food we take every day like dal, chapati, rice, curd, vegetables, fruits, milk, etc. is called diet.

2. What does a balanced diet depend on?

Ans. The balanced diet depends on the sex, age group and profession of a person.

3. What is calorie?

Ans. Calorie is a unit of energy. 1 calorie is the amount of heat energy needed to raise the temperature of 1000 grams of water by 1°C.

In terms of nutrition, calorie is the amount of heat energy produced when a certain amount of food is burnt in the body.

4. What is PEM?

Ans. PEM (Protein Energy Malnutrition) is a disease caused due to shortage of proteins, fats and carbohydrates in the diet.

5. What leads to obesity?

Ans. Eating energy-rich food in excess than needed by the body causes fat deposition in the body and leads to obesity.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- The sugar found in milk is
(a) sucrose (b) fructose (c) glucose (d) lactose
- Which of these gets deposited on the walls of blood vessels if we take excess of animal fats?
(a) roughage (b) cellulose (c) cholesterol (d) vitamins
- Excess eating of carbohydrates and fats causes
(a) goitre (b) obesity
(c) kwashiorkar (d) jaundice
- These nutrients are needed for growth and repair.
(a) carbohydrates (b) fats (c) proteins (d) vitamins
- This vitamin helps in the normal growth of bones in children.
(a) vitamin E (b) vitamin K
(c) vitamin D (d) vitamin B₁
- Pulses, soyabean and fish are rich sources of
(a) carbohydrates (b) proteins (c) minerals (d) vitamins
- Scurvy is caused due to the deficiency of
(a) vitamin A (b) vitamin B (c) vitamin C (d) vitamin D

B. Write *True* or *False* against each statement.

- Vitamin D can be made in our skin in the presence of sunlight. True
- One gram of protein produces more energy than that of carbohydrate. False
- Plant proteins are better than animal proteins. False
- Balanced diet should contain a variety of food items of animal and plant origin. True
- Cellulose is a good source of energy for us. False

C. Answer in one word.

- Food containing cellulose fibres. Roughage
- Swollen neck caused due to deficiency of iodine in food. Goitre
- A disease caused due to the deficiency of calcium in food. Osteoporosis
- The nutrient that protects our body against diseases. Vitamin

D. Define these terms.

1. Balanced diet

Ans. The diet which contains all the essential nutrients in right proportions is called a balanced diet.

2. Dehydration

Ans. Removal of water is called dehydration.

3. Roughage

Ans. The fibre part of food which simply adds bulk to the food is called roughage.

4. Amino acids

Ans. Amino acids are basic units of proteins.

E. Answer these questions.

1. Name the major nutrients in our food.

Ans. The major nutrients in our food are carbohydrates, fats, proteins, vitamins and minerals.

2. What are fats? Name some sources of fats.

Ans. Fats are energy-giving foods. They give more energy than the carbohydrates. They are obtained from both plants and animals.

Plants sources of fats are dry fruits, groundnut, coconut and seeds of sunflower, mustard, etc. Animal sources of fats are milk, meat, fish, egg-yolk, butter, ghee and cheese.

3. State the role of sodium and potassium in our body.

Ans. Sodium and potassium maintain water balance in the body.

4. Why are minerals and vitamins called protective nutrients?

Ans. Vitamins and minerals are called protective nutrients because they protect our body from various diseases.

5. What is roughage? Why is the presence of fibres in food essential?

Ans. The fibre part of food which simply adds bulk to the food is called roughage. The presence of fibres in food is essential because they help in easy movement of bowel and prevent constipation.

6. What is a balanced diet? Name the factors that determine the composition of a balanced diet.

Ans. The diet which contains all the essential nutrients in right proportions is called a balanced diet. The factors which determine the composition of a balanced diet are sex, age group and profession of a person.

F. Encircle the odd-one out and give reasons for your choice.

1. Masoor, moong, rice, gram, peas

Ans. Rice: Rice contains carbohydrate while others contain proteins.

2. Mango, peas, pear, grapes, peach

Ans. Peas: Peas are vegetable while others are fruits.

3. Bread, biscuits, cereals, egg

Ans. Egg: It is obtained from animals while others are obtained/made from plant sources. (or Egg is a rich source of proteins while others are rich source of carbohydrates.)

4. Butter, groundnut, cashewnut, coconut

Ans. Butter: Butter is a animal fat while others are plant fats.

G. Skill-based questions.

1. Why do doctors recommend refined oil instead of animal fats like desi ghee?

Ans. Animal fats are rich in saturated fats. Their excess in the body may cause deposits called plaque in the arteries. The clogged arteries are responsible for heart diseases and high blood pressure.

2. Why are animal proteins better than plant proteins?

Ans. Animal proteins contain all the 20 amino acids needed by our body. Plant proteins lack some of the essential amino acids.

3. Why does our body never suffer fat deficiency?

Ans. Our body never suffers fat deficiency because excess of carbohydrates and proteins are converted into fats and are stored in the body.

H. Activity/Project–Do as directed.

Perform an activity to test the presence of fats in butter.

Ans. Do it yourself.

Think Zone

1. Annu loves to eat wafers, pizzas, chocolates, toffees, etc. but not vegetables and fruits. Her doctor advised her to take more of vegetables, fruits and chapatis. Why?

Ans. Wafers, pizzas, chocolates and toffees are rich source of carbohydrates and fats. They add to the body weight and cause obesity.

Green vegetables and fruits are source of vitamins and minerals which are needed for proper growth and good health. Their deficiency in food causes various deficiency diseases. They also provide dietary fibres needed for easy and regular bowel movement.

2. Mannu goes to school without taking his breakfast and gets tired very soon. He also develops headache. What do you think is the reason for this?

Ans. Food gives us energy. Missing breakfast leads to lack of energy. Lack of energy causes tiredness and headache.

3. Naresh eats lots of chocolates. He is too fat to run fast. Why is it so?

Ans. Chocolates are rich in fats and sugars. Both these are stored in the body adding to the body weight and obesity.

4. What is ORS? Find out.

Ans. ORS is oral rehydration salt solution.

ANSWERS

Check Point 1

1. What is a fabric?

Ans. The material that we use for clothing is called fabric.

2. What is a yarn?

Ans. A yarn is a loose thread of which a fabric is made.

3. How are fibres broadly classified?

Ans. Fibres are broadly classified into two main groups which are natural and man-made fibres.

4. What do you understand by spinning?

Ans. Spinning is the process of making yarn from fibres.

5. From which part of the plant is jute obtained?

Ans. Jute is obtained from the stem of the jute plant.

6. List the states of India where jute is mainly grown.

Ans. The states where jute is mainly grown are Meghalaya, Bihar, Assam, West Bengal and Odisha.

7. What is the process of making yarn from fibre called?

Ans. Spinning

Check Point 2

Fill in the blanks.

1. Wool is a good absorber of heat.
2. Early Indians started growing cotton near the Ganga river.
3. Synthetic fibres are resistant to chemicals.

PRACTICE TIME

A. MCQs–Choose the correct answers.

1. Yarns are made of very thin strands called
 - (a) fabrics
 - (b) fibres
 - (c) looms
 - (d) none of these

2. Weaving is done on special machines called
 (a) gins (b) looms (c) combs (d) needles
3. Rearing of silkworms for the production of silk is called
 (a) spinning (b) weaving (c) sericulture (d) ginning
4. Which of these is called a golden fibre?
 (a) cotton (b) silk (c) rayon (d) jute
5. Which of these is a natural fibre?
 (a) rayon (b) acrylic (c) polyester (d) silk
6. All fabrics are made of loose threads called
 (a) yarns (b) bolls (c) gins (d) looms
7. The other name of flax is
 (a) wool (b) linen (c) silk (d) jute
8. What type of climate is best suited for growing jute plant?
 (a) dry (b) warm
 (c) humid (d) warm and humid

B. Fill in the blanks.

1. Fibres are classified as natural and synthetic.
2. Cotton fibres are soft and durable.
3. The fruits of cotton plants are called cotton bolls.
4. The process of making yarn from fibre is called spinning.
5. Linen is obtained from flax plant.
6. Jute is obtained from the stem of jute plant.
7. Warm and humid climate is best for growing jute.
8. Jute is a natural fibre whereas nylon is a man-made fibre.
9. Wool traps the air between its fibres.
10. Weaving is done by special machines called looms.

C. Write True or False against each statement.

- | | |
|---|--------------|
| 1. Wool is a synthetic fibre. | <u>False</u> |
| 2. Natural fibres are mainly obtained from plants and animals. | <u>True</u> |
| 3. The cultivation of cotton plant requires very low temperature. | <u>False</u> |
| 4. The fruits of cotton plant are called flax. | <u>False</u> |
| 5. The process of making yarn from fibre is called ginning. | <u>False</u> |
| 6. Jute fibre is obtained from the fruit of jute plant. | <u>False</u> |
| 7. Silk is obtained from the silkworm cocoon. | <u>True</u> |

D. Answer in one word.

- | | |
|--|-------------------------|
| 1. Yarns are made of these thin strands. | <u>Fibres</u> |
| 2. Nylon, rayon, acrylic and polyester. | <u>Synthetic fibres</u> |

3. The process of separating the cotton fibres from its seeds.

Ginning

4. Rearing of silkworms for the production of silk.

Sericulture

E. Differentiate between the following.

1. Natural fibres and man-made fibres

Ans. Natural fibres are obtained from the stem, bark, leaves or seeds of plants and hair of animals, whereas man-made fibres are manufactured in factories.

2. Spinning and ginning

Ans. The process of making yarn from fibre is called spinning, whereas the process of separating cotton fibres from the seeds by combing is called ginning.

F. Answer these questions.

1. What are natural fibres? Give two examples of natural fibres.

Ans. The fibres obtained from plants and animals are called natural fibres. Cotton and wool are examples of natural fibres.

2. What are man-made fibres? Give two examples of man-made fibres.

Ans. The fibres manufactured in factories from chemicals are called man-made fibres. Nylon and rayon are man-made fibres.

3. Give three properties of man-made fibres.

Ans. (a) Man-made fibres do not wrinkle easily.
(b) They are very strong.
(c) They catch fire easily.

4. Choose the natural fibres from the following:

Wool, nylon, cotton, rayon, jute, linen, polyester

Ans. Wool, cotton, jute, linen

5. What are the sources of natural fibres?

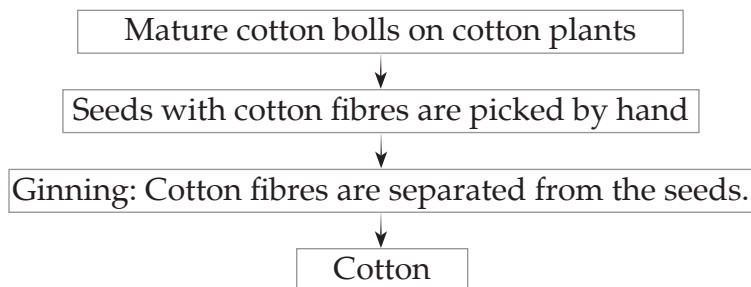
Ans. Natural fibres are obtained from stem, bark, leaves, seeds, etc. of plants, hair of animals and cocoon of insect.

6. Where is cotton grown in India?

Ans. In India, cotton is grown in Maharashtra, Madhya Pradesh, Tamil Nadu, Karnataka, Gujarat, Uttar Pradesh, Andhra Pradesh, Haryana and Punjab.

7. How is cotton obtained?

Ans. Obtaining cotton involves the following steps:



8. What is the use of cotton gins?

Ans. Cotton gins are used to separate cotton fibres from cotton seeds.

9. Where is jute grown in India?

Ans. Jute is grown in Meghalaya, Bihar, Assam, West Bengal and Odisha.

10. What type of climate is required for growing jute plants?

Ans. Warm and humid climate is required for growing jute plants.

11. How is jute obtained?

Ans. Jute is obtained from jute plant. The stems of plants are cut and kept in water till they rot. The fibres are then separated by hand.

12. Give two properties of silk fibre.

Ans. (a) Silk fibre is strong and shiny.
(b) It keeps our body warm in cold weather.

G. Give reasons for the following.

1. Jute is used as a packing material.

Ans. Jute fibres are strong and durable and are one of the cheapest natural fibres. Therefore, they are used as a packing material.

2. We wear woollen clothes during winter season.

Ans. Wool is a good absorber of heat and keeps the body warm. Therefore, we prefer to wear woollen clothes in winter.

3. In olden days, people simply draped fabrics to cover their bodies.

Ans. In olden days, people simply draped fabrics to cover their bodies because stitching was not known at that time.

H. Skill-based questions.

1. Wool, silk, cotton and jute are called natural fibres. Why are they called so?

Ans. We get wool from sheep, silk from silkworm and cotton and jute from cotton and jute plants respectively. They all occur naturally and are not manufactured in factories. Therefore, they are called natural fibres.

2. We prefer to wear cotton clothes in summer. Why?

Ans. Cotton clothes absorb sweat quickly and keep the body cool. Therefore, we prefer to wear cotton clothes in summer.

I. Activity/Project–Do as directed.

1. Perform an activity to show that yarns are made of very thin strands called fibres.

Ans. Do it yourself.

2. Collect the cuttings of different types of fabrics from a tailor's shop. Paste them neatly in a scrapbook. Find out their names and whether they are synthetic or man-made and their uses.

Ans. Do it yourself.

Think Zone

1. What kind of soil is needed to grow cotton plants?

Ans. Black soil found in southern India and alluvial soil found in northern India are best suited for growing cotton plants.

2. West Bengal is the main jute-producing state of India. Can you think why?

Ans. Jute grows well in warm and humid climate and the climatic conditions of West Bengal are well-suited for its cultivation.

ANSWERS**Check Point 1**

1. Encircle the odd-one out.

(a) Book, copper, aluminium, gold

(b) Cotton boll, silk cloth, a metal spoon, sponge

Ans. (a) Book (b) A metal spoon

2. List any three properties that can be used to group various objects around us.

Ans. (a) Appearance (b) Texture (c) Solubility

3. Correct the following statements:

(a) We can sort the objects which are similar in all respects into different groups.

(b) A bulb is made from plastic.

(c) Materials that have lustre are usually made of rubber.

Ans. (a) We can sort the objects which are similar in all respects into a group.

(b) A bulb is made of glass and metal wires.

(c) Materials that have lustre are usually made of metals.

Check Point 2

1. Name two gases which are soluble in water.

Ans. Oxygen and carbon dioxide

2. Which of these will float on water?

Ice, coin, cork, lemon, stone, wax

Ans. Ice, cork and wax

3. Name two objects made from opaque materials.

Ans. Cardboard, aluminium foil

PRACTICE TIME

A. MCQs—Choose the correct answers.

1. These objects are seen, but not clearly.

(a) transparent

(b) opaque

(c) translucent

(d) none of these

2. This object does not sink in water.
 (a) stone (b) coin
 (c) a piece of paper (d) needle
3. This is not soluble in water.
 (a) sugar (b) salt (c) methane (d) baking powder
4. Which of the following is an opaque object?
 (a) book (b) butter paper
 (c) glass piece (d) cellophane sheet
5. Which of these is insoluble in water?
 (a) common salt (b) sugar (c) vinegar (d) mustard oil
6. Which of these is a bad conductor of electricity?
 (a) silver (b) copper (c) wood (d) aluminium

B. Match the columns.

- | Column A | Column B |
|-------------|-------------|
| 1. Belt | (a) Metal |
| 2. Bucket | (b) Wood |
| 3. Stapler | (c) Paper |
| 4. Magazine | (d) Plastic |
| 5. Door | (e) Leather |

C. Answer in one word.

1. Materials which cannot be compressed. Hard materials
2. Materials through which objects cannot be seen. Opaque materials
3. Materials which do not allow electric current to pass through them. Insulators

D. Define these terms.

1. Lustrous and nonlustrous objects

Ans. The objects which shine are called lustrous objects, whereas those which do not shine are called nonlustrous objects.

2. Magnetic and nonmagnetic substances

Ans. Substances which are attracted by magnets are called magnetic substances, whereas those which are not attracted by magnets are called nonmagnetic substances.

E. Answer these questions.

1. Common salt is soluble in water whereas sand is not. What is meant by this statement?

Ans. This statement means that salt dissolves or mixes well in water, whereas sand does not dissolve and mix in water.

2. Mention different properties of material.

Ans. Different properties of material are its appearance, texture, solubility in water, ability to float or sink in water, transparency, heat and electrical conductivities and its magnetic and nonmagnetic behaviours.

3. What are the conductors of electricity?

Ans. Substances which allow electric current to pass through them are called conductors of electricity.

F. Give reasons for the following.

1. Some objects made of metal become dull after some time.

Ans. Some objects made of metal become dull after some time because metals combine with oxygen, carbon dioxide or moisture present in the air and form a layer on their surface which gives them dull appearance.

2. Handles of most of the cooking utensils are made of plastic or wood.

Ans. Handles of most of the cooking utensils are made of plastic or wood because these materials are bad conductors of heat. Therefore, they do not allow heat to pass through them and hence, do not become hot.

G. Skill-based questions.

1. On the basis of which common property would you like to group these objects and why?

(a) Paper, sand, a metal key, sponge, leaf, cork, an eraser, an iron nail

(b) Sugar, salt, apple, chair, orange, table, flower vase, fan, biscuit

Ans. (a) We can group these objects on the basis of ability to float or sink in water.

(b) We can group these objects on the basis of edible and non-edible items.

2. Sneha's room is a real mess. Her parents have decided to put four shelves in her room so that she can store her things.



(a) Can you make labels for the four shelves, so that she knows what she can store in each shelf.

(b) What criteria would you use to decide, what should go in the four shelves?

Ans. (a) Labels: Stationery, Clothes, Toys, Books

(b) The four shelves are labelled on the basis of use of things. Pen, Pencil and paper are used for writing. So, they will go into the shelf labelled stationery.

Clothing material like pants and other clothes will go into the shelf labelled clothes.

Playing material like toys will go into the shelf labelled toys.

Studying material, i.e., books will go into the shelf labelled books.

3. Talk to your friends in the class. Did any of them use some other criteria to label the shelves? Discuss with them how they made their decision.

Ans. Do it yourself.

H. Activity/Project–Do as directed.

Perform an activity to show that some objects are soluble in water while others are insoluble in water.

Ans. Do it yourself.

Think Zone

1. A grocer groups various objects in his shop. Why?

Ans. A grocer groups various objects in his shop to make it convenient to locate the objects. It makes convenient for the customers also to look for a particular item.

2. Can you think of any other ways, which are not mentioned in the chapter, by which objects can be grouped.

Ans. Some other ways by which objects can be grouped are as follows:

- (a) Solids, liquids and gases
- (b) Edible and Non-edible things
- (c) Living and Nonliving things
- (d) Natural and man-made materials
- (e) Combustible and non-combustible things

ANSWERS

Check Point 1

1. Give reasons.

- (a) Tea granules are separated from tea.
- (b) Small stones and husk are separated from dal or rice before cooking.
- (c) Pebbles are separated from sand.

- Ans.** (a) The caffeine present in the granules mixes with water and milk during tea making. Tea granules become useless once the caffeine is extracted. Hence, they are separated.
- (b) Small stones and husk are wastes that harm the body. That is why, they are separated from rice or dal before cooking.
- (c) Pebbles are an impurity in sand. They are separated from sand to make it useful for construction purposes.

2. Name the method of separation used to separate a mixture of:

- (a) uncooked dal and rice.
- (b) grain seeds and stalks.
- (c) husk and grains.
- (d) pebbles and sand at construction sites.

- Ans.** (a) Handpicking (b) Threshing (c) Winnowing (d) Sieving

Check Point 2

Fill in the blanks.

1. The substance that remains in filter paper is called residue.
2. Evaporation is the process of converting water into water vapour.
3. The mixture of solute and solvent is called a solution.

PRACTICE TIME

A. MCQs—Choose the correct answers.

1. Most of the substances present around us are

- (a) pure substances
- (b) mixtures
- (c) compounds
- (d) none of these

2. Which of the following can be separated by filtration?
 (a) salt and sugar (b) sand and stones
 (c) sand and water (d) iron pieces and sand
3. The liquid that passes through tiny holes in a filter paper is called the
 (a) filtrate (b) residue (c) sediment (d) solute
4. A mixture of peas and guavas kept together in a basket can be separated by
 (a) sieving (b) handpicking (c) sedimentation (d) evaporation
5. The most convenient method for separating husk and stone from rice before cooking is
 (a) decantation (b) filtration (c) handpicking (d) winnowing
6. A mixture of coconut oil and water can be separated by
 (a) filtration (b) handpicking (c) decantation (d) evaporation
7. Which of the following properties is used in separating a mixture of solids by winnowing?
 (a) difference in colour (b) difference in shape
 (c) difference in size (d) difference in weight
8. Peanuts are separated from a mixture of pulses and rice by
 (a) winnowing (b) sieving (c) filtration (d) handpicking
9. Which method is used for separating turmeric powder from cumin (jeera)?
 (a) sieving (b) filtration (c) handpicking (d) none of these

B. Write True or False against each statement.

1. Condensation is the process in which vapour is converted back into a liquid. True
2. Decantation is the best method of separating tea granules from prepared tea. False
3. Husk can be separated from pebbles by filtration. False
4. Seeds and solid particles of pulp can be separated from fruit juice by decantation. False

C. Answer in one word.

1. The method used to obtain salt from sea water. Evaporation
2. The process of pouring out the clear upper liquid without disturbing the settled particles. Decantation
3. The method by which two immiscible liquids can be separated. Decantation
4. A method used to separate lighter components of a mixture by wind. Winnowing
5. Name a method that can be used to separate saw dust from a mixture of saw dust and water. Filtration

D. Define these terms.

1. Decantation

Ans. Decantation is the process of pouring out liquid after sedimentation to separate insoluble solid from a solid-liquid mixture.

2. Filtration

Ans. Filtration is a method of separating insoluble solid from a liquid in solid-liquid mixture by passing through a filter.

3. Sediment

Ans. The substance that settles at the bottom of a liquid is called sediment.

4. Winnowing

Ans. Winnowing is the method of separating husk from grains with the help of wind.

E. Answer these questions.

1. What do you understand by handpicking?

Ans. The method of separating a mixture into its components by hand is called handpicking. For example, stones are separated from rice by using the method of handpicking.

2. What do you understand by threshing?

Ans. The process of separating grains from stalks is called threshing.

3. How is common salt obtained from sea water?

Ans. Common salt is obtained from sea water by evaporating sea water trapped in shallow pits by the sun's heat. It leaves behind a mixture of salts which is purified to obtain common salt.

4. How do we separate impurities and bran from flour? Why?

Ans. Impurities and bran from flour are separated by sieving. This is because they have various sized particles which can be separated by passing them through a suitable sieve.

5. Why do we need to separate the components of a mixture?

Ans. We need to separate the components of a mixture to remove harmful and useless components and to obtain useful components of the mixture.

6. Explain handpicking method with two examples other than those given in the chapter.

Ans. The method of separating a mixture into its components by hand is called handpicking. For example, Manual weeding in crop fields, picking ripe fruits from a tree.

F. Give reasons for the following.

1. A mixture of sugar and water cannot be separated by filtration.

Ans. Filtration method is used to separate insoluble solids from liquids.

Sugar is soluble in water. It forms solution in water. Therefore, mixture of sugar and water cannot be separated by filtration.

2. After harvesting the crop, the farmer cannot separate husk from grains by handpicking.

Ans. Farmer cannot separate husk from grains by handpicking because there is huge amount of grains and it will take months or years to do so.

3. Stones and husk are removed from rice before cooking.

Ans. Stones and husk are removed from rice before cooking because they are non-edible and hard. They may cause pain in stomach, if taken with food.

4. Water is called a universal solvent.

Ans. Water is called a universal solvent because it can dissolve many substances in it.

G. Skill-based questions.

1. **Ria has prepared a saturated solution of sugar in water. Can she still dissolve some more sugar into this solution? If yes, how?**

Ans. Yes, Ria can dissolve some more sugar into this solution. This can be done by heating the sugar solution for some time. By increasing the temperature, Ria will be able to dissolve more sugar into the saturated solution.

2. **Can a mixture of sugar and salt be separated by adding them to water and then filtering this mixture? Why/Why not?**

Ans. No, a mixture of sugar and salt cannot be separated by adding them to water and then filtering this mixture. This is because both sugar and salt are soluble in water and will pass through the fine pores of filter paper.

H. Activity/Project–Do as directed.

Perform an activity to obtain clear water from the muddy water.

Ans. Do it yourself.

Think Zone

1. **The mustard oil cannot be separated from a mixture of oil and water by filtration method. Why?**

Ans. Both mustard oil and water can pass through the pores of filter paper. Therefore, a mixture of mustard oil and water cannot be separated by filtration.

2. **In water treatment plants, water is allowed to stand undisturbed in large water tanks. Why?**

Ans. This is done to separate heavier solids like sand particles which are insoluble in water. Most of the insoluble solid impurities settle down at the bottom of the tank. This is called sedimentation.

ANSWERS

Check Point 1

1. Circle the changes which you think are reversible:

melting of a chocolate, ripening of banana, boiling of a potato, dissolving of sugar in water, mixing of water and oil, burning of paper.

Ans. Melting of chocolate, dissolving of sugar in water, mixing of water and oil

2. State true or false.

- (a) A reversible change can be undone. True
 (b) Mixing of sand in water is an irreversible change. False
 (c) When we mix salt with water, a permanent change is caused. False

Check Point 2

Fill in the blanks.

- When we freeze water, it changes into ice.
- No new substance is formed in a physical change.
- A chemical change is an irreversible change.
- Burning of a substance is a chemical change.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- Which one of these is reversible change?

| | |
|----------------|--|
| (a) dissolving | (b) melting |
| (c) folding | (d) all of these <input checked="" type="checkbox"/> |
- No new substance is formed in this change.

| | |
|--|------------------|
| (a) physical <input checked="" type="checkbox"/> | (b) chemical |
| (c) permanent | (d) irreversible |
- This is a kind of physical change.

| | |
|---------------------|---|
| (a) burning of coal | (b) burning of an incense stick |
| (c) burning of wood | (d) melting of butter <input checked="" type="checkbox"/> |

4. Most chemical changes are

| | |
|---|----------------------|
| (a) reversible change | (b) temporary change |
| (c) irreversible change <input checked="" type="checkbox"/> | (d) physical change |
5. This is a reversible change.

| | |
|---|-----------------------|
| (a) inflating a balloon <input checked="" type="checkbox"/> | (b) rusting of iron |
| (c) burning of matchstick | (d) breaking of glass |
6. Which of the following is a chemical change?

| | |
|--|-------------------------|
| (a) making a paper aeroplane | (b) making a paper boat |
| (c) burning of a paper <input checked="" type="checkbox"/> | (d) inflating a balloon |
7. Which of these is a reversible change?

| | |
|-------------------------------------|--|
| (a) changing of milk to curd | (b) growing of a plant |
| (c) growing of a baby into an adult | (d) melting of ice <input checked="" type="checkbox"/> |
8. Which of these is not a physical change?

| | |
|---|---|
| (a) stretching a rubber band | (b) melting of butter |
| (c) burning a piece of coal <input checked="" type="checkbox"/> | (d) changing of water into water vapour |
9. Which of these is an irreversible change?

| | |
|---|-------------------------|
| (a) burning of a matchstick <input checked="" type="checkbox"/> | (b) inflating of tyres |
| (c) lighting a bulb | (d) inflating a balloon |

B. Fill in the blanks.

1. In a chemical change, new substances are formed.
2. In a physical change, no new substances are formed.
3. Squeezing of a rubber ball is an example of a physical change, while burning of a candle is a chemical change.
4. Most chemical changes are irreversible.
5. Most physical changes are reversible.

C. Define these terms.

1. Reversible change

Ans. A change which can be undone or reversed is called a reversible change.

2. Irreversible change

Ans. A change which cannot be undone or reversed is called an irreversible change.

3. Physical change

Ans. A change in which no new material (substance) is formed is called a physical change.

4. Chemical change

Ans. A change in which new material (substance) is formed is called a chemical change.

D. Write 'R' if a change is reversible and 'I' if a change is irreversible.

| Change | R/I |
|---------------------------------|-----|
| 1. Water forms ice. | R |
| 2. Glass breaks. | I |
| 3. Seed grows into a plant. | I |
| 4. Air is filled in a football. | R |
| 5. Egg is boiled. | I |
| 6. Clothes are dipped in water. | R |
| 7. Vegetable is cooked. | I |

E. Classify the following changes as physical or chemical changes.

- Melting of an ice cream Physical change
- Breaking of a cup Physical change
- Water changing to form steam Physical change
- Burning of wood Chemical change
- Digestion of food Chemical change
- Switching on the fan Physical change
- Greying of hair Chemical change
- Plant growing into a tree Chemical change
- Deflating of a cycle tyre Physical change
- Cloth burnt by hot iron Chemical change

F. Answer these questions.

1. What happens when ice is heated? Is it a reversible or an irreversible change? Justify your answer.

Ans. When ice is heated, it melts into liquid water. It is a reversible change because when liquid water is frozen, it changes back into ice.

2. What happens when lemon juice is mixed with baking powder? Is it a physical or a chemical change? Justify your answer.

Ans. When lemon juice is mixed with baking powder, a gas is formed. It is a chemical change because on mixing these substances, a new substance which is a gas is formed.

3. Idli batter is steamed to get idlis. Is it a reversible or an irreversible change? Justify your answer.

Ans. Steaming of idli batter to get idlis is an irreversible change because we cannot get back idli batter from idlis.

4. Think of at least six changes and classify them as reversible and irreversible changes.

Ans. (a) Melting of ice into liquid water — Reversible change
(b) Evaporation of water into water vapour — Reversible change
(c) Condensation of water vapour into liquid water — Reversible change
(d) Melting of wax into liquid wax — Reversible change

- (e) Baking of cake batter — Irreversible change
- (f) Curdling of milk — Irreversible change

G. Encircle the odd-one out and give reasons for your choice.

- 1. Souring of milk, inflating a balloon, cooking of food, burning of coal.**

Ans. Inflating a balloon; because it is a physical change while others are chemical changes.

- 2. Making of ice cubes, melting of butter, frying of potatoes, heating of water.**

Ans. Frying of potatoes; because it is a chemical change while others are physical changes.

H. Skill-based questions.

- 1. Have you seen things made from clay? Clay is a type of soft earth that can be moulded into different shapes. When clay is baked, it becomes very hard. Is baking of clay a reversible or an irreversible change?**

Ans. Baking of clay is an irreversible change.

- 2. Formation of curd from milk is an irreversible change as you cannot get back milk from curd. Is this change a physical or a chemical change?**

Ans. Formation of curd from milk is a chemical change.

- 3. Make a list of a few changes that you observe around you (other than the ones discussed in the chapter).**

Ans. (a) Conversion of wood into sawdust (b) Burning of a fuel
(c) Rusting of iron (d) Melting of ice cream

- 4. Think of at least six changes and classify them as reversible and irreversible changes.**

Ans. (a) Breaking of cup — Irreversible
(b) Grinding of wheat — Irreversible
(c) Melting of wax — Reversible
(d) Tearing of paper — Irreversible
(e) Changing of water into steam — Reversible
(f) Weathering of rocks — Irreversible

I. Activity/Project—Do as directed.

You are given vinegar and baking powder. Show that a change takes place on mixing the two.

Ans. Do it yourself.

Think Zone

Have you ever seen the formation of a reddish-brown flaky substance on an iron object?

- (a) What is this reddish-brown flaky substance called?**

- (b) Is the formation of the reddish-brown flaky substance a physical or a chemical change?**

Ans. (a) The reddish-brown flaky substance is called rust.
(b) It is a chemical change.

ANSWERS

Check Point 1

1. What is an organism?

Ans. A living thing is called an organism.

2. What is a cell?

Ans. A cell is the smallest unit of structure and function of the body of living things.

3. Which is the largest cell?

Ans. The largest cell is the egg cell of Ostrich.

4. State whether the following are *true* or *false*.

(a) All organisms are made of cells.

True

(b) Nonliving things can also grow like living things.

False

(c) All living and nonliving things have definite organisation.

False

(d) Only living things are called organisms.

True

Check Point 2

1. What is breathing?

Ans. The process of inhaling fresh air and exhaling used air is called breathing.

2. Which gas is exhaled along with used air?

Ans. Carbon dioxide

3. Why do plants not release carbon dioxide during daytime?

Ans. The carbon dioxide produced during daytime by plants is used in the process of photosynthesis. So, plants do not release carbon dioxide during daytime.

4. Which gas is used in respiration and which gas is formed?

Ans. Oxygen is used in respiration and carbon dioxide is formed.

5. Why is respiration essential for all organisms?

Ans. All organisms can get energy only due to the process of respiration. That is why, it is essential for them.

Check Point 3

1. What is stimulus?

Ans. The change in the environment that evokes an organism to react to it is called a stimulus.

2. Define response.

Ans. The reaction of body to a stimulus is called response.

3. What are tropic movements?

Ans. The movements in plants either away from or towards the direction of stimulus are called tropic movements.

4. What excretory products are produced in plants?

Ans. Gum, resin and latex are excretory products of plants.

5. When do stomata open and close?

Ans. Stomata open during daytime and close at night.

Check Point 4

1. What is reproduction?

Ans. Reproduction is the ability of living things to produce their own kind.

2. Name two egg-laying animals.

Ans. Snake and lizard.

3. What is lifespan?

Ans. Lifespan is the period for which an organism lives.

4. When does the lifespan of an organism begin and end?

Ans. Lifespan begins with the birth of an organism and ends with its death.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- The process of elimination of wastes from the body of animals is called
(a) secretion (b) egestion (c) excretion (d) maturation
- In plants, growth is
(a) internal and unlimited (b) internal and limited
(c) external and unlimited (d) external and limited
- Phototropism is
(a) folding of leaves of touch-me-not
(b) growth of root away from light
(c) movement of sunflower towards the sun
(d) movement of *Amoeba* towards light
- Which of the following is made up of one cell?
(a) human being (b) dog (c) *Amoeba* (d) cat
- The ability of an organism to move from one place to another is called
(a) locomotion (b) movement
(c) growth (d) response
- Plants breathe through
(a) roots (b) stomata (c) buds (d) flowers

7. The period for which an organism lives is called its
 (a) development (b) growth (c) lifespan (d) habitat
8. Movement of any part of a plant in the direction of stimulus is called
 (a) adaptation (b) tropism (c) locomotion (d) none of these

B. Match the columns.

Column A

Column B

- | | |
|--|------------------|
| 1. Taking in air and its release | (a) Stomata |
| 2. Bending of a plant towards light | (b) Autotrophs |
| 3. Openings on the surface of leaf | (c) Respiration |
| 4. Breaking down of food to release energy | (d) Breathing |
| 5. Green plants | (e) Phototropism |

C. Answer in one word.

- | | |
|---|--------------------|
| 1. A change in the surroundings that makes us to react to it. | <u>Stimulus</u> |
| 2. The process of oxidation of food to release energy. | <u>Respiration</u> |
| 3. The period for which an organism lives. | <u>Lifespan</u> |
| 4. The process of emergence of a seedling from a seed. | <u>Germination</u> |
| 5. Single-celled organisms. | <u>Unicellular</u> |
| 6. Animals that lay eggs. | <u>Oviparous</u> |
| 7. The excretory product of breakdown of proteins. | <u>Urea</u> |

D. Define these terms.

1. Breathing

Ans. The process of inhaling fresh air into lungs and exhaling used air from lungs through nose is called breathing.

2. Respiration

Ans. The process of burning or oxidation of food inside the body cells to release energy is called respiration.

3. Autotrophs

Ans. The organisms which can make their food from raw materials are called autotrophs.

4. Heterotrophs

Ans. The organisms which cannot make their own food and eat plants or other organisms are called heterotrophs.

E. Answer these questions.

1. What are tropic movements?

Ans. The movements in plants either away from or towards the direction of stimulus are called tropic movements.

2. How do stomata help plants?

Ans. Stomata help plants in breathing by allowing movement of air in and out.

3. Why do living organisms need food?

Ans. Living organisms need food to get energy for their various life processes.

4. How do plants make their food? What is this process called?

Ans. Plants make their food by taking energy from the sun, water from soil and carbon dioxide from air. This process is called photosynthesis.

5. Why do all living things respire?

Ans. All living things respire to get energy.

6. How do plants respire?

Ans. Plants respire with the help of tiny pores called stomata present on the surface of leaves.

7. What happens when you enter a darkroom from brightly lit area?

Ans. When we enter a darkroom from brightly lit area, we are not able to see for some time.

8. How do animals reproduce?

Ans. Animals reproduce by laying eggs or by giving birth to young ones.

9. What is the basic difference in the growth pattern of plants and animals?

Ans. Plants grow throughout their life, whereas animals stop growing after a particular age.

F. Give reasons for the following.

1. Why are plants called autotrophs?

Ans. Plants are called autotrophs because they can synthesise their own food from raw materials using the sun's energy.

2. Why are animals called heterotrophs?

Ans. Animals are called heterotrophs because they cannot make their food and get it from plants or other animals.

3. Why do plants not excrete carbon dioxide during daytime whereas animals do?

Ans. Plants do not excrete carbon dioxide during daytime because the carbon dioxide produced during daytime by plants is used up in photosynthesis.

4. Why does a plant placed in a dark room bend towards the window?

Ans. A plant placed in a dark room bends towards the window because the stem always grows towards light.

G. Skill-based questions.

1. How can you show that plants also show response to stimuli?

Ans. Take a 'touch-me-not' plant. Touch a leaflet of it with your finger. The touched leaf gets folded showing its response to the stimulus of touch.

2. Name the gas which is a byproduct of photosynthesis in plants but essential for human beings?

Ans. Oxygen

3. A car takes fuel, burns it to produce energy, moves and excretes smoke. Why can't we call the car a living thing?

Ans. A car is not a living thing because it does not respire, move on its own, and reproduce its own kind.

4. A crystal can break into many pieces and grow in size if kept in saturated solution. Is crystal a living thing?

Ans. A crystal is not a living thing because it breaks due to external force and grows due to the deposition of substance from outside. On the other hand, the growth is internal in living forms.

H. Activity/Project–Do as directed.

With a suitable experiment show that a plant responds to environmental stimuli.

Ans. Do it yourself.

Think Zone

1. Movement is a characteristic of animals, i.e., all animals move. Sponges and corals do not move, still we call them animals and not plants. Why?

Ans. Sponges and corals are not plants because their cells do not have chlorophyll to synthesise their food. They do not have stomata to breathe. They feed like animals.

2. Fishes have gills to breathe in water. How do whales breathe?

Ans. Whales are mammals. They breathe through the lungs. To breathe air, they come to the surface of water.

Habitat of the Living Things

ANSWERS

Check Point 1

Fill in the blanks.

1. Relationship of plants and animals with their environment is studied under ecology.
2. Animals living in oceans are called marine animals.
3. Environment includes physical surroundings, climate and living organisms.
4. Zebras, deer, buffaloes, etc. are found in grassland habitat.

Check Point 2

1. Fill in the blanks.

- (a) Fishes obtain oxygen dissolved in water.
- (b) Predators are carnivorous animals.
- (c) Succulents have fleshy stems to store water.
- (d) Long and strong canines help in tearing the flesh.

2. Give one word for the following.

- (a) Plants growing in deserts.
- (b) Plants growing in water.
- (c) Fin that helps in changing direction while swimming.
- (d) Animals that become active at night.

- Xerophytes
Hydrophytes
Caudal fin
Nocturnal animals

Check Point 3

Give one word for the following.

1. Animals that feed on dead bodies.
2. Green pigment found in plants.
3. Release of nutrients from dead plants and animals by decomposers.
4. The flow of energy through food.

- Scavengers
Chlorophyll
Biodegradation
Food chain

Check Point 4

Fill in the blanks.

1. The loamy soil is best for agriculture.
2. The layer of air around the earth is called atmosphere.

- Oxygen is given out during photosynthesis by green plants.
- Animals living in burrows have reduced eyes.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- Which of the following is not an abiotic component?
 (a) soil (b) air (c) bacteria (d) oxygen
- Which is the main source of energy on the earth?
 (a) fire (b) plants (c) sun (d) water
- Which of the following is a decomposer?
 (a) fungi (b) humus (c) plants (d) fire
- Sun's energy passes from
 (a) green plants to a carnivore (b) green plants to a herbivore
 (c) green plants to microbes (d) green plants to nongreen plants
- Plants that live in water are called
 (a) hydrophytes (b) halophytes (c) succulents (d) xerophytes
- Which of these is not a natural habitat?
 (a) sea (b) desert (c) zoo (d) mountain
- Which of these is not an adaptation of aquatic animals?
 (a) gills (b) fins (c) slippery skin (d) padded sole
- Which of these is the best soil for agriculture?
 (a) sandy (b) clayey (c) loamy (d) none of these
- Which of these are decomposers?
 (a) vultures (b) bacteria (c) hyenas (d) jackals
- Which of these are responsible for adding up to the carbon dioxide volume in air?
 (a) excessive cutting of forests (b) increasing human population
 (c) increase in the number of vehicles (d) all of these

B. Fill in the blanks.

- Living components of an environment are called biotic components.
- The tips of leaves of rainforest trees are called drip tips.
- Living organisms cannot survive below 0 °C for long.
- Loamy soil is a mixture of sand, silt and clay.
- Ozone layer in the atmosphere protects organisms from ultraviolet radiation.

C. Answer in one word.

- The study of relationship of living things with their surroundings. Ecology
- Plants which grow in deserts. Xerophytes
- Animals which eat plants. Herbivores
- Animals which feed on dead animals. Scavengers

5. Animals which can live both on land and in water.

Amphibians

6. The soil most suitable for plant growth.

Loamy

7. The structures which help fish to swim in water.

Fins

D. Differentiate between the following.

1. Biotic and abiotic components

Ans. The living components of environment are called biotic components. They are plants, animals and microorganisms. On the other hand, nonliving components of environment are called abiotic components. They are air, water, soil, temperature, etc.

2. Xerophytes and hydrophytes

Ans. Plants growing in deserts are called xerophytes, whereas plants growing in water are called hydrophytes.

3. Aquatic and terrestrial habitats

Ans. The habitat of water is called aquatic habitat. It includes oceans, seas, rivers, ponds, lakes, pools, etc. On the other hand, the land habitat is called terrestrial habitat. It includes forests, deserts, tundra and mountains.

4. Primary and secondary consumers

Ans. Animals which eat plants are called primary consumers, whereas animals which eat primary consumers (herbivores like cow, deer, etc.) are called secondary consumers (lion, tiger, etc.).

E. Answer these questions.

1. Describe the adaptive features of aquatic plants and animals.

Ans. Aquatic plants have following adaptive features:

(a) Floating plants like *Lemna* have swollen and spongy stems and leaves.

(b) Submerged plants like *Hydrilla* have their roots embedded in the mud. They have narrow leaves with no stomata.

(c) Fixed plants like Lotus have broad leaves which float on the surface of water. They have long and hollow stems.

Aquatic animals like fish have the following adaptations to live in water:

(a) They have streamlined and spindle-shaped body which reduces friction with water and helps them to swim.

(b) Fishes use gills to breathe in oxygen dissolved in water.

(c) They have fins which propel them in water and help in swimming.

(d) Their caudal fin steers the body and helps in changing the direction while swimming.

(e) They have scaly and slippery skin covered with hard waterproof scales and slime which protect them from rotting in water.

2. How is camel adapted to live in desert?

Ans. Camel has following adaptations to live in desert:

(a) It has thick skin to prevent loss of water.

(b) It excretes concentrated urine to save water.

- (c) It stores water by drinking large quantity of water at a time.
- (d) It has hump at the back which stores fat. This fat provides energy and water.
- (e) It has large padded soles which help in walking on loose sand.

3. Name the various biotic components of environment. How are they interrelated?

Ans. The biotic components of environment are plants, animals and microorganisms. They depend on each other. Animals depend on plants for oxygen, food, medicines, shade, shelter, wood, timber, etc. In return, animals help in pollination, dispersal of seeds and provide carbon dioxide to plants. The decomposers release nutrients from dead organisms and help in recycling of nutrients in the environment.

4. What is a food chain? How are plants and animals related in a food chain?

Ans. A chain of transfer of energy through food in environment is called a food chain. The flow of energy in a food chain occurs from green plants to herbivores, then to carnivores and finally to decomposers.

5. How is soil formed?

Ans. Soil is formed by the weathering of rocks by wind, water and temperature.

6. What is humus? Why is it essential for plant growth?

Ans. Humus is decaying plant and animal matter which is found in the topmost layer of the soil. It makes the soil fertile as it is rich in minerals and organic matter.

7. Mention the importance of ozone layer in the atmosphere.

Ans. Ozone layer acts as a blanket over the earth. It absorbs harmful ultraviolet rays of the sun and prevents them from reaching the earth's surface.

8. How is balance of carbon dioxide and oxygen maintained in nature?

Ans. All living beings take in oxygen and give out carbon dioxide during respiration. On the other hand, green plants take in carbon dioxide and release oxygen during photosynthesis. In this way, balance of carbon dioxide and oxygen is maintained in nature.

F. Give reasons for the following.

1. Leaves in cacti are modified into spines.

Ans. To prevent loss of water by evaporation, the leaves in cacti are modified into spines.

2. Green plants are called producers.

Ans. Green plants can make food from raw materials. They provide food to all animals. Therefore, they are called producers.

3. Animals living in cold areas have fur.

Ans. The fur on the body of animals living in cold areas protects the heat of their body from escaping out. This saves them from cold.

4. A fish does not survive outside water.

Ans. Fish is adapted to live in water. It breaths through gills. Gills take oxygen dissolved in water. Outside water, gills collapse and dry up. Hence, they cannot take oxygen. This stops breathing in fish and it dies.

5. Aquatic animals have streamlined body.

Ans. The streamline-shape of body reduces friction due to water. This helps aquatic animals swim easily in water.

6. Microorganisms are called decomposers.

Ans. Microorganisms break down the dead and decaying material of plants and animals into simpler forms. Therefore, they are called decomposers.

7. Loamy soil is good for plants.

Ans. Loamy soil has good water-holding capacity and plenty of air. Therefore, it is good for plants.

G. Skill-based questions.

1. Why do fishes have streamlined body?

Ans. Streamlined body reduces friction in water and helps in swimming. Hence, fishes have streamlined body.

2. Frog's tadpole has gills but frog has lungs, why?

Ans. Frog's tadpole lives in water. In water, it breathes through gills. Adult frog is amphibious. On land, it breathes through lungs.

3. The stem in cactus is green with several spines but no leaves. Why?

Ans. Cactus grows in deserts in the scarcity of water. Therefore, to prevent the loss of water by evaporation from leaves, its leaves change into spines and to carry out the main function of leaves which is photosynthesis, its stem becomes green.

4. Annu shifts the potted plants from her room into sunlight every two or three days. Why does she do it?

Ans. Plants kept in sunlight are healthy. Inside the room, plants do not get sunlight and hence, are unable to prepare their food by photosynthesis. Therefore, plants inside the room become weak. So, Annu shifts them in and out of the room to keep them healthy.

5. What will happen if there are no microorganisms?

Ans. Microorganisms decompose dead and decaying plants, animals as well as their wastes and release minerals in the soil. If there are no microorganisms, the earth will get covered with dead and decaying plants, animals and their wastes. There will be no recycling of nutrients between soil and plants and hence, plants will not get the mineral nutrients.

6. Why are some insects green and leaf-like?

Ans. Some insects are green and leaf-like to camouflage with the surrounding green leaves of the plants on which they live. This helps them not to be identified by their enemies and hence, saves their life.

H. Encircle the odd-one out and give reasons for your choice.

1. Camel, desert rat, lizard, frog, snake

Ans. Frog: Frog is an amphibian while others are desert animals.

2. Water lily, lotus, Vallisneria, Agave

Ans. *Agave*: *Agave* is a desert plant while others are aquatic plants.

3. Penguin, polar bear, cow, walrus

Ans. Cow: Cow is found in grassland habitat while other animals are found in tundra habitat.

4. Acacia, Hydrilla, Agave, Opuntia

Ans. *Hydrilla*: *Hydrilla* is an aquatic plant while others are desert plants.

5. Sand, gravel, clay, silt, loam

Ans. Loam; Loam is a soil while others are different types of soil particles.

I. Activity/Project–Do as directed.

1. Perform an activity to show that soil contains air.

Ans. Do it yourself.

2. Took a lotus leaf and sprinkle some water over it. You would find that the water moves away in the form of silvery balls from the surface. Find reason for this observation.

Ans. Do it yourself.

Think Zone

1. Why is camel called the ship of desert?

Ans. A camel is able to survive in scorching heat and dry conditions of desert. It is adapted to walk long distances on soft sand of desert. It is the only means of transport in deserts. Hence, it is called the ship of the desert.

2. Mannu's father parks his car in the sun with all its window panes and doors shut. When he opens the door of his car after a few hours, he finds it very hot inside the car. Why?

Ans. Light rays falling on the windscreen of car converge inside and heat the air. Hot air is unable to escape out of the car and becomes hotter than the outer air due to greenhouse effect.

Plants – Form and Functions

ANSWERS

Check Point 1

Fill in the blanks.

1. Roots are nongreen, underground part of the plant.
2. The root grows away from sunlight.
3. The root that develops from the radicle of seed is called primary root.
4. The adventitious roots arise from the base of the stem of the plant.
5. Carrot, radish and turnip are tap roots.
6. Prop roots arise from horizontal branches.
7. There is no main root in fibrous root system.

Check Point 2

1. Fill in the blanks.

- (a) The aerial part of a plant forms shoot system.
- (b) The stem of trees is called trunk.
- (c) The region of stem from where leaves arise is known as node.
- (d) Stem helps in the transport of water up to leaves.

2. Give one example for each of the following.

- | | |
|--|------------------|
| (a) Stem that stores food and becomes tuber-like. | <u>Potato</u> |
| (b) Stem that is modified into stem tendrils. | <u>Grapevine</u> |
| (c) Stem that becomes green and prepares food for the plant. | <u>Cactus</u> |

Check Point 3

1. Give proper term for each of the following.

- | | |
|--|-----------------------------|
| (a) Leaves without petiole. | <u>Sessile leaves</u> |
| (b) Spring-like coiled structure formed by the modification of leaf. | <u>Leaf-tendrils</u> |
| (c) Flattened, green part of the leaf. | <u>Lamina or leaf blade</u> |
| (d) The arrangement of veins and veinlets in the lamina of leaf. | <u>Venation</u> |

2. Fill in the blanks.

- Petiole is absent in sessile leaves.
- In monocot leaves, the venation is parallel.
- A compound leaf has a group of leaflets.
- Midrib is the continuation of petiole in lamina.

Check Point 4

Fill in the blanks.

- The female gametes of a flower are called ovules and are found in ovary.
- Petals attract insects for pollination.
- Male gametes are formed in the pollen grains.
- The ovary grows into fruit.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- Which of the following is a herb?
(a) rose (b) *Bougainvillea*
(c) mustard (d) bamboo
- Which of the following is not a taproot?
(a) radish (b) stilt root (c) turnip (d) carrot
- Which of the following is not a modified stem?
(a) sweet potato (b) potato (c) ginger (d) corm
- Which of the following is not the function of leaves?
(a) loss of excess of water by transpiration (b) absorption of water
(c) respiration (d) photosynthesis
- Pattern of distribution of veins in the lamina is called
(a) venation (b) transpiration
(c) pollination (d) fixation
- This is the part of stem between two adjacent nodes.
(a) leaf axil (b) node
(c) internode (d) root
- Which of these anchor the plant in the soil?
(a) stems (b) leaves (c) fruits (d) roots
- The root developed from the radicle is
(a) secondary (b) primary (c) tertiary (d) root cap
- This is a kind of biennial plant.
(a) mustard (b) wheat (c) gram (d) radish
- Swollen basal part of the carpel is
(a) petals (b) ovule (c) ovary (d) pollen

B. Match the columns.

| Column A | Column B |
|--|-------------------------|
| 1. Accessory whorls | (a) Radish |
| 2. Leaves modified into spines | (b) Stem |
| 3. Transport of water and minerals to leaves | (c) Maize and sugarcane |
| 4. Loss of excess of water from plants | (d) Cacti |
| 5. Taproot | (e) Potato |
| 6. Modified stem | (f) Monocot plants |
| 7. Stilt roots | (g) Calyx and corolla |
| 8. Fibrous roots | (h) Transpiration |

C. Answer in one word.

1. Protective covering on the tip of root. Root cap
2. The network of veins and veinlets in the lamina. Venation
3. The part of leaf by which lamina is attached to the node of stem. Petiole
4. The leaf in which the lamina is divided into leaflets. Compound leaf
5. The flower having both stamens and carpels. Bisexual or complete flowers

D. Differentiate between the following.

1. Herbs and shrubs

Ans. Herbs are small plants with soft and green stem having a lifespan of few months to one year, whereas shrubs are medium-sized woody plants which survive for several years.

2. Taproot and fibrous roots

Ans. The root which is formed of one main long root and its branches is called taproot, whereas the roots which are formed of cluster of fibre-like roots at the base of the stem are called fibrous roots.

3. Monocot leaf and a dicot leaf

Ans. Monocot leaf is sessile and has parallel venation, whereas dicot leaf is stalked and has reticulate venation.

4. Calyx and corolla

Ans. Calyx is the outermost whorl of the flower which is formed of green leaf-like sepals, whereas corolla is a whorl just inside the calyx and is made up of brightly coloured or scented petals.

E. Define these terms.

1. Sessile

Ans. A leaf without a petiole is called a sessile leaf.

2. Primary root

Ans. The main root of taproot system is called primary root.

3. Perennation

Ans. Perennation is the survival of some plants from one season to the next by means of stored food in their underground parts.

4. Pollination

Ans. Transfer of pollen grain from anther to stigma is called pollination.

F. Answer these questions.

1. Give two functions of root.

Ans. (a) Roots anchor the plant in the soil.
(b) Roots absorb water and minerals from the soil.

2. Name different parts of a taproot.

Ans. Different parts of a taproot are primary root, secondary roots and tertiary roots.

3. List five main characteristics of stem.

Ans. (a) Stem is an aerial part and grows towards light.
(b) It has nodes and internodes.
(c) It bears leaves, branches, buds, flowers and fruits.
(d) It connects roots with rest of the plant parts.
(e) Young stems are green but older woody stems are nongreen and hard.

4. State the function of a tendril and give an example of a stem tendril.

Ans. Tendril provides support to weak stem by coiling around some object. Stem tendril is found in grapevine.

5. Name the parts of a typical leaf.

Ans. The parts of a leaf are lamina or leaf blade, petiole, leaf base, mid rib and veins.

6. Give three main functions of leaves.

Ans. (a) Leaves manufacture food by the process of photosynthesis.
(b) Leaves expel excess of water through stomata by the process of transpiration.
(c) Leaves carry out respiration by breathing in oxygen and breathing out carbon dioxide through stomata.

7. Name one insectivorous plant. Describe the structural modification for trapping the insects.

Ans. An insectivorous plant is pitcher plant. Its lamina is modified into a pitcher-like structure, petiole flattens and leaf apex forms the lid of the pitcher.

8. State one function of

- | | |
|----------------------|---------------------------|
| (a) spines of cactus | (b) tendrils of sweet pea |
| (c) pedicel | (d) thalamus |
| (e) ovule | (f) stigma |

Ans. (a) To save water, the leaves of cacti get modified into spines.
(b) Tendrils of sweet pea provide support to its weak stem to climb by coiling around some object.
(c) Pedicel is the stalk of the flower with which flower is attached to the plant.
(d) Thalamus gives place to attach all floral parts.
(e) Ovule forms seed after fertilisation.
(f) Stigma traps the pollen grains during pollination.

9. What is a flower? Give functions of a flower.

Ans. Flower is a reproductive part of a plant.

Functions of a flower are as follows:

- (a) It carries out sexual reproduction.
- (b) It forms fruits and seeds.
- (c) It produces nectar which honeybees collect to prepare honey.
- (d) Perfumes are prepared from flowers.
- (e) It is used for decoration.

G. Give reasons for the following.

1. Stem in cacti and succulents is green and fleshy.

Ans. Cacti and succulents are desert plants which grow in the scarcity of water. To save water, the leaves of cacti get modified into spines and to carry out the main function of leaves which is photosynthesis, its stem becomes green. The stem of succulents stores water and becomes fleshy.

2. Petals are brightly coloured and sweet scented.

Ans. Petals are brightly coloured and sweet scented to attract insects for pollination.

3. Some leaves in pea form thread-like structures.

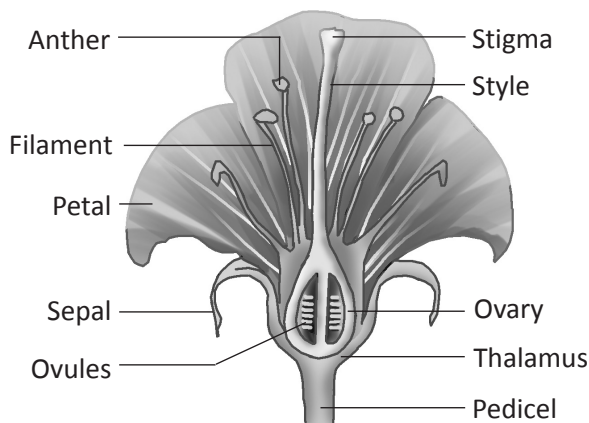
Ans. Thread-like structures called tendrils in pea provide support to its weak stem to climb by coiling around some object.

H. Draw the following diagrams and label their different parts.

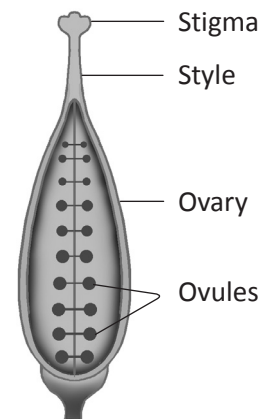
1. Flower

2. Pistil

Ans. 1. Flower



2. Pistil



I. Skill-based questions.

1. Why do roots of pea, bean and gram plants have root nodules? How are these nodules formed?

Ans. In the roots of pea, bean and gram plants, nitrogen-fixing symbiotic bacteria live and form nodules. They are able to form nitrogen compounds from atmospheric nitrogen and provide these to the plant.

2. What will happen if vaseline is applied to the under surface of a dicot leaf?

Ans. In a dicot leaf, stomata are present on the under surface. Application of vaseline will clog stomata due to which exchange of gases as well as transpiration will not occur.

3. Which whorls of a flower are called its essential parts and why?

Ans. Male whorl or stamens and female whorl or carpels are called essential whorls of a flower because they are essential for reproduction, i.e., formation of seeds and fruits.

4. If a plant has fibrous roots, what will be the venation in its leaves?

Ans. Fibrous roots are found in monocot plants and the leaves of monocot plants have parallel venation.

5. Why is iodine solution used to test the presence of starch in a leaf?

Ans. Starch is a colourless or white substance. Iodine solution is purple in colour and forms blue colour with starch.

6. Flowers that open at night are white in colour. Why?

Ans. In dark night, white colour is clearly visible. Therefore, flowers that open at night are white in colour to attract insects for pollination.

7. Some flowers produce nectar. Why?

Ans. Flowers produce nectar to attract honeybees and other insects for pollination.

8. Ankit found a small plant without leaves. He observed it and found that it has fibrous roots. What will be the type of venation in its leaves?

Ans. Parallel venation.

J. Activity/Project—Do as directed.

Show that transpiration in plants takes place through leaves. Record this activity in your practical notebook under the heads: aim, materials required, procedure and conclusion.

Ans. Do it yourself.

Think Zone

1. Why are flowers so brightly coloured?

Ans. Flowers are brightly coloured to attract insects to carry out pollination in them.

2. Ajay saw a honey bee sitting on a flower. What was it doing there?

Ans. Honeybee collects nectar from flowers for food of the colony and in doing so, it pollinates flowers.

3. During autumn, the leaves of deciduous trees change colour from green to red, then orange and yellow, and finally fall down. Why?

Ans. In deciduous trees, as a protection against severe winter, the trees shed their leaves during autumn. Prior to leaf fall, the chlorophyll in leaves is lost gradually and photosynthesis is reduced. Instead, red, orange or yellow pigments appear and finally dead leaves fall down.

ANSWERS

Check Point 1

Fill in the blanks.

1. Testes is an organ of male reproductive system.
2. Stomach is a part of digestive system.
3. Bones and cartilages are organs of skeletal system.
4. Excretory system has kidneys, urinary bladder and ureters.
5. Respiratory system transfers oxygen to the blood.

Check Point 2

Fill in the blanks.

1. Skeleton forms the supporting framework of the body.
2. Production of red blood and white blood cells is the major function of bones.
3. There are 33 vertebrae in human backbone.
4. The forearm is supported by two long bones.

Check Point 3

Fill in the blanks.

1. Elbow/knee is an example of hinge joint.
2. A cartilagenous disc is present between the vertebrae of backbone.
3. Movement of bones is brought about by the contraction and relaxation of muscles.
4. The cartilage present between two bones absorbs shock and reduces friction.
5. The up and down movements of our arm are controlled by biceps and triceps.

Check Point 4

Fill in the blanks.

1. Setae are bristle-like projections.
2. The claws and adhesive pads help a cockroach to climb.
3. Body of fish is spindle-shaped and streamlined.
4. Birds fly with the help of wings.

PRACTICE TIME

A. MCQs—Choose the correct answers.

1. Setae are present in
(a) fish (b) earthworm (c) *Hydra* (d) cockroach
2. Chitinous exoskeleton is present in
(a) cockroach (b) earthworm (c) snake (d) snail
3. Immovable joints are present in
(a) chest bones (b) vertebrae (c) skull bones (d) ankle bones
4. Bone formed from the collar bone and shoulder blade is
(a) backbone (b) shoulder bone
(c) breastbone (d) hip bone
5. How many pairs of legs does a cockroach have?
(a) one (b) two (c) three (d) four
6. Which body part of a fish helps in changing the direction of movement while swimming?
(a) tail (b) fins (c) gills (d) eyes
7. Bones and cartilage form the
(a) reproductive system (b) skeletal system
(c) nervous system (d) circulatory system
8. The upper arm has one long bone attached to the shoulder blade called
(a) femur (b) ulna (c) radius (d) humerus

B. Fill in the blanks.

1. Endoskeleton or skeletal system is composed of bones and cartilages.
2. The bony framework is absent in invertebrates.
3. The bones of skull protect the brain.
4. RBC and WBC are produced in the bone marrow of some bones.
5. Spinal cord passes through a bony tube.
6. Contraction of biceps muscle in arm pulls the arm towards body.

C. Answer in one word.

1. The hard skeletal framework present within the body. Skeleton
2. Muscles that are attached to the bony skeleton. Skeletal muscles
3. The tissue that attaches muscles to the bone. Tendon
4. The ring-shaped bony structures that surround and protect the spinal cord. Vertebrae
5. The flexible connective tissue band that joins the two bones and keeps them in position. Ligament

D. Define these terms.

1. Tissue

Ans. A tissue is a group of similar cells that jointly perform a special function.

2. Organ

Ans. A number of tissues working together to perform the same function make up an organ.

E. Answer these questions.

1. Give any five functions of skeletal system.

- Ans.** (a) Skeletal system forms the framework that supports the body.
(b) It gives proper shape to the body. It surrounds and protects inner delicate organs, like lungs, heart, brain, eyes, etc.
(c) It provides attachment to the skeletal muscles and helps in the movement of body parts like arms, legs, etc.
(d) Skeletal system with muscles helps in locomotion and handling of various objects.
(e) Red blood corpuscles (RBC) and white blood corpuscles (WBC) are produced in the bone marrow of some long bones.

2. Describe the structure of a synovial joint. Why is there fluid in the cavity of synovial joint?

Ans. The joint where one bone moves freely on the other is called a synovial joint. In this type of joint, there is a space between two articulating or moving bones called synovial cavity. This cavity is filled with synovial fluid. The ends of two bones are covered with synovial cartilage.

The fluid, i.e., synovial fluid in the cavity of synovial joint lubricates the moving bones and reduces friction between them.

3. How does a pivot joint differ from a ball and socket joint?

Ans. In a pivot joint, one bone rotates on the rounded or conical end of the other bone in many planes, i.e., up and down and side-to-side. On the other hand, in a ball and socket joint, the end of one bone is rounded as a ball which fits into a socket in the other bone. The bone with ball-like head moves freely in all directions.

4. How are ligaments different from tendons?

Ans. Ligaments are bands of flexible connective tissue which hold two bones in position at a joint, whereas tendons are bands of tough fibrous connective tissue which connect muscles to bones.

5. What is the difference between locomotion and movement?

Ans. The movement of an animal as a whole from one place to another is called locomotion while change in the position of any body part is called movement.

6. How does an earthworm move?

Ans. An earthworm moves by crawling movements produced by the alternate contraction and relaxation of muscles of the body wall. While moving, earthworm holds the rear part of the body to the surface and extends its front part. Then the extended front part holds the surface and rear part is released and is pulled forward. By repeating these movements, the earthworm crawls ahead on the ground.

F. Encircle the odd-one out and give reasons.

1. **Heart, lungs, bones, excretion**

Ans. Excretion: Excretion is a body function while others are body organs.

2. **Earthworm, snake, snail, fish**

Ans. Fish: Fish locomotes by swimming while others by crawling.

3. **Upper arm, forearm, ankle, wrist**

Ans. Upper arm: Upper arm has one bone while others have more than one bones.

Or

Ankle: It is a part of leg while others are parts of arm.

4. **Exoskeleton rings, setae, legs, wings**

Ans. Legs: Legs are formed of endoskeleton while others are formed of exoskeleton.

5. **Hip joint, elbow joint, knee joint**

Ans. Hip joint: Hip joint is formed of ball and socket joint while others are formed of hinge joint.

G. Skill-based questions.

1. **Some long bones have red bone marrow. Why?**

Ans. Long bones have red bone marrow for the formation of red blood corpuscles (RBCs).

2. **The head of long bones is covered with cartilage cap. Why?**

Ans. The head of long bones is covered with a cap of cartilage to avoid friction when one bone moves over the other.

3. **Skeletal muscles or voluntary muscles are arranged in antagonistic pairs. Why?**

Ans. Skeletal muscles are arranged in antagonistic pairs because they work in pairs by contraction and relaxation. When one muscle contracts, its antagonistic muscle relaxes.

4. **Earthworm has small bristle-like setae. What is their use to the earthworm?**

Ans. Setae provide grip on the surface while crawling. Thus, they help the earthworm in locomotion.

H. Give reasons for the following.

1. **Backbone is formed of many ring-shaped bony pieces.**

Ans. The backbone is formed of many ring-shaped bony pieces to provide flexibility for bending while protecting the spinal cord inside it.

2. **Our body has different types of joints.**

Ans. We do different types of activities like eating, breathing, running, jumping, walking, sitting, bending, etc. through the movement of our body parts. Our body moves at different degrees to carryout a specific task for which they need a special type of joint. For example, legs and arms move freely while knee and elbow move in one direction only, so they have movable joints. Our chest moves partially during breathing, so the ribs have partially movable joints. Skull bones have immovable joints and make protective covering around the brain. Thus, different types of joints in the body help to perform different actions efficiently.

3. Snake moves in a zigzag manner.

Ans. Snakes do not have legs. They have long and cylindrical body with a long backbone. They have well-developed muscles attached to backbone, ribs and skin. The contraction of muscles creates curves or loops along the whole body. Each curve creates a push and the snake moves in a zigzag manner.

I. Draw the following diagrams and label their different parts.

1. A synovial joint

Ans. Do it yourself.

2. A hinge joint

Ans. Do it yourself.

J. Activity/Project–Do as directed.

Find out the movement of multicellular organism called *Hydra*. Try to find a picture/diagram of its movement. Paste it in your notebook.

Ans. Do it yourself.

Think Zone

1. An earthworm finds it difficult to move on a sheet of glass. Why?

Ans. Setae present in the skin of earthworm take grip of the rough surface while crawling. Glass sheet has hard and smooth surface and does not provide grip to the setae. Hence, earthworm is unable to crawl on a smooth glass sheet.

2. How can we get our bones photographed?

Ans. We can get our bones photographed by X-rays.

ANSWERS

Check Point 1

1. What is a physical quantity?

Ans. Anything which can be measured is called a physical quantity.

2. What is an angul?

Ans. The width of a finger is known as an angul.

3. What is a foot of length?

Ans. The length of a foot of a person is known as a foot of length.

4. Can a cubit be taken as a standard unit? Why?

Ans. No, because a standard unit should be commonly used throughout the world in standard form. But, the measure of a cubit differs from person to person.

5. What is a standard unit?

Ans. A standard unit is a universally accepted measurement of a common fixed quantity.

Check Point 2

1. Write the numerical value of these words:

(a) kilo

(b) milli

(c) centi

Ans. (a) 1000

(b) 1/1000

(c) 1/100

2. How many kilometres make 7000 m?

Ans. 1000 m = 1 km

$$7000 \text{ m} = 1/1000 \times 7000 \text{ km} = 7 \text{ km}$$

3. How many cm are there in 1.5 km?

Ans. 1.5 km = 1.5 × 1000 m = 1500 m = 1500 × 100 cm = 150000 cm

4. How many mm are there in 39 cm?

Ans. 39 cm = 39 × 10 mm = 390 mm

5. Match the measuring devices in column A with the measurable objects in column B.

Column A

Column B

Measuring tape

length of a room

Scale

dress to be stitched

Metre rod

girth of a pole

Thread

width of a pencil box

6. What steps should be followed while measuring a given length using a scale?

Ans. To measure the given length, put zero mark of scale on one end of the object and read the mark on the scale corresponding to the other end of the object.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- Which measuring device will you use to measure the girth of a tree?
(a) Divider (b) Ruler
(c) Measuring tape (d) All of these
- The SI unit of length is
(a) cm (b) dm (c) m (d) mm
- This is not a basic physical quantity.
(a) mass (b) time
(c) temperature (d) volume
- Which unit of length will you use to express the distance between New Delhi and Mumbai?
(a) m (b) km (c) cm (d) dm
- A distance of 5.4 km is equal to
(a) 5400 cm (b) 540 cm (c) 54 cm (d) 540000 cm
- A rope of 7.5 m is equal to
(a) 75 mm (b) 750 mm
(c) 7500 mm (d) 75000 mm
- What is the smallest length which can be measured accurately by using a scale?
(a) 1 cm (b) 1 m
(c) 1 km (d) 1 mm

B. Write True or False against each statement.

- The SI unit of length is centimetre. False
- Decimetre is a submultiple of metre. True
- Measurement using body part is not accurate. True
- Accuracy of measurement is not required in scientific processes. False
- A scale with a broken edge can also be used to measure a length correctly. True

C. Match the columns.

- | Column A | Column B |
|--------------------------------------|----------------|
| 1. Distance between two stars | (a) millimetre |
| 2. Distance between Delhi and Jaipur | (b) light year |
| 3. Width of a pencil box | (c) metre |
| 4. Thickness of a coin | (d) kilometre |
| 5. Length of a fabric | (e) centimetre |

D. Answer in one word.

1. One-thousandth part of a kilometre. Metre
2. A fixed known amount of a quantity, which is universally accepted. SI unit
3. The SI unit of length. Metre
4. A length equal to ten millimetres. One centimetre

E. Define these terms.

1. Physical quantity

Ans. Anything which can be measured is known as a physical quantity.

2. Cubit

Ans. The distance between the elbow and the tip of the middle finger of an arm is called a cubit.

3. SI unit

Ans. A unit in international system is called SI unit.

F. Answer these questions.

1. How will you use a scale to measure a line, whose zero-mark is invisible?

Ans. We will use the next complete mark of the scale in place of zero-mark and then subtract its value from the measured length. This way, we can get the correct measurement of a line.

2. What precautions should one follow while reading a scale.

Ans. While reading a scale, the eye should be correctly positioned just vertically above the mark of the scale to be noted down.

3. How can you measure the length of a curved line, using a thread and a scale?

Ans. The length of a curved line can be measured by using a thread as follows:

Take a thread and tie a knot at its one end. Place the knot at starting point of the curved line. Carefully move the thread along the length of the curved line, holding the thread at small distances between thumb and first finger. On reaching the end point of the curved line, put a mark on the thread using a pen.

Now, stretch the thread along a metre scale and measure the length between the knot and the pen mark. This is the length of the curved line.

4. The distance between Nishant's house and his school is 1.75 km. Change this in metres.

Ans. 1 km = 1000 m, $\therefore 1.75 \text{ km} = 1.75 \times 1000 = 1750 \text{ m}$.

5. The depth of a well is 1550 cm. Calculate the depth of the well in metres.

Ans. 100 cm = 1 m $\therefore \frac{1550}{100} = 15.5 \text{ m}$

6. Ginni's height is measured as 142 cm. Find her height in metres and millimetres.

Ans. 100 cm = 1 m, 10 mm = 1 cm

$\therefore 142 \text{ cm} = \frac{142}{100} = 1.42 = 1 \text{ m } 42 \text{ cm or } 1420 \text{ mm}$

G. Give reasons for the following.

1. A cubit cannot be used as a standard unit of length.

Ans. A standard unit is same throughout the world, but the measure of the cubit varies from person to person. Therefore, it cannot be used as a standard unit of length.

2. Units of all quantities should be standardised internationally.

Ans. There is need of standard units of measurement as contrary to personal units because standard units do not vary. They are fixed, universally accepted, give exact measurement of objects and make day-to-day life easy.

3. Metre cannot be used to measure all the lengths but its multiples and submultiples are required for correct measurement.

Ans. Practically, not all the lengths can be conveniently measured in metres. For example, it would be tedious to measure the distance between two cities in metres. Similarly, measuring the size of a dice of ludo or an eraser with the help of a metre scale would not give accurate result. Therefore, depending upon the length, more practical units are used for measurement. For measuring small lengths, submultiples and for larger lengths, multiples of metre are used.

H. Skill-based questions.

1. A book of English has 200 pages, including the cover pages. The sheets except the cover pages are each of thickness 0.005 cm. The cover pages are having a thickness of 0.05 cm each. What is the thickness of the book?

Ans. The thickness of book includes thickness of 200 pages and thickness of cover pages, i.e.,

$$\text{Thickness of book} = \text{thickness of 200 pages} + \text{thickness of cover pages}$$

$$\therefore \text{Thickness of one sheet} = 0.005 \text{ cm}$$

$$\text{No. of sheets in 200 pages} = \frac{200}{2} = 100 \text{ sheets}$$

$$\therefore \text{Thickness of 100 sheets} = 0.005 \times 100 \\ = 0.5 \text{ cm}$$

$$\text{Thickness of cover pages at 2 sides} = 0.05 \times 2 = 0.10 \text{ cm}$$

$$\text{The thickness of book} = 0.5 \text{ cm} + 0.1 \text{ cm} \\ = 0.6 \text{ cm}$$

2. You are given a metre rod and a measuring tape. Which device will you use for measuring each of the following, and why?

(a) The girth of your school bag

(b) The length of your classroom

Ans. (a) I will use measuring tape to measure the girth of my school bag because measuring tape can be wrapped around the bag.

(b) I will use metre rod to measure the length of my classroom because metre rod remains straight and can be handled by a single person easily.

3. A two-metre long piece of cloth is cut into five equal pieces. Calculate the length of each piece of cloth in centimetres.

Ans. Length of the cloth piece = $2 \text{ m} = 2 \times 100 \text{ cm} = 200 \text{ cm}$

Length of each newly cut piece = $\frac{200}{5} \text{ cm} = 40 \text{ cm}$

I. Activity/Project–Do as directed.

Perform an activity to measure the girth of the wrist of your friend using a thread.

Ans. Do it yourself.

Think Zone

Ritika has to measure the length of her pencil. The zero-mark on her scale is not visible. What should she do to get the correct measurement of her pencil.

Ans. Ritika should use the next complete mark of the scale in place of zero-mark and then subtract its value from the measured length. This way she can get the correct measurement of her pencil.

Objects in Motion

ANSWERS

Check Point 1

1. Give one word for the following:

- (a) A type of motion in which an object moves along a curved line. Curvilinear motion
 (b) When the object as a whole moves from one place to another on a circular path. Circular motion
 (c) When the position of an object does not change with respect to a fixed point, with time. Rest
 (d) The to-and-fro motion of a body around a fixed point. Oscillatory motion

2. Give two examples each of the following:

(a) Moving objects

Ans. (a) (i) Flying bird (ii) Jumping ball

(b) Objects in curvilinear motion

Ans. (a) A car moving on a curved path (ii) A ball hit by a batsman

(c) Objects in oscillatory motion

Ans. (a) A swing (ii) The pendulum in a wall clock

Check Point 2

1. Give one word for the following:

- (a) A motion which repeats itself after a fixed period of time.
 (b) Irregular motion in any possible direction.

Ans. (a) Periodic motion (b) Random motion

2. Give two examples each of the following:

(a) Nonperiodic motion

(b) Translatory motion

Ans. (a) (i) Beating of a drum (ii) Heartbeat of a sick person
 (b) (i) A car moving on a road (ii) A train moving on railway track

PRACTICE TIME

A. MCQs—Choose the correct answers.

1. To-and-fro motion around fixed point is

- (a) translatory (b) circulatory (c) oscillatory (d) periodic

2. The motion of a car moving on a straight path is
 (a) periodic (b) oscillatory (c) rotatory (d) rectilinear
3. The motion in turning of the blades of a fan is
 (a) rotatory (b) periodic (c) oscillatory (d) rectilinear
4. The motion produced by beating of a drum is
 (a) periodic (b) nonperiodic (c) rotatory (d) oscillatory
5. Planets moving around the Sun show
 (a) periodic motion (b) translatory motion
 (c) nonperiodic motion (d) oscillatory motion
6. A moving pendulum in a wall clock is
 (a) random motion (b) periodic motion
 (c) curvilinear motion (d) rotatory motion
7. Irregular motion in any possible direction is called
 (a) circular motion (b) curvilinear motion
 (c) rotatory motion (d) random motion
8. A moving swing is a kind of
 (a) rectilinear motion (b) oscillatory motion
 (c) periodic motion (d) nonperiodic motion

B. Match the columns.

Column A

Column B

- | | | |
|-------------------------------------|-------|-------------------|
| 1. A planet moving around the sun | _____ | (a) Revolutionary |
| 2. A boy walking on a straight road | _____ | (b) Random |
| 3. A car moving on a hilly road | _____ | (c) Oscillatory |
| 4. A flying bird | _____ | (d) Rotatory |
| 5. A moving swing | _____ | (e) Curvilinear |
| 6. Handle of a sewing machine | _____ | (f) Rectilinear |

C. Answer in one word.

1. Give an example of an object at rest. A stone lying on the road
2. Give an example of an object in motion. Running of an athlete
3. What are very fast oscillations called? Vibrations

D. Differentiate between the following.

1. Rotation and revolution

Ans. Rotation: When an object moves on a fixed axis without changing its position, it is said to be in rotation or rotatory motion. For example, the motion of the earth on its axis is a rotatory motion.

Revolution: The objects moving on a circular path, change their position on the whole from one place to another. For example, planets moving around the sun are said to be in revolution or revolutionary motion.

2. Periodic and nonperiodic motions

Ans. Periodic motion: The motion which repeats itself after a fixed period of time is called periodic motion. For example, rotation of the earth on its axis.

Nonperiodic motion: The motion which repeats itself at irregular intervals of time is called nonperiodic motion. For example, the heartbeat of a sick person.

E. Answer these questions.

1. Describe motion.

Ans. An object is said to be in motion if it changes its position with respect to a fixed object with time.

2. Explain translatory motion and its types.

Ans. If a body moves on the whole, from one place to another, so that all its body parts move the same distance in a given time, it is said to be in a translatory motion. It is of two types:

Rectilinear motion: When an object, on a whole, moves along a straight path, then it is said to be in rectilinear motion.

Curvilinear motion: When an object, on a whole, moves along a curved path, then it is said to be in curvilinear motion.

3. Explain how a screw, when being fixed on a wooden board, has two simultaneous motions.

Ans. A screw being fixed on a wooden board has two simultaneous motions. It shows rotatory motion when its head is moved by a screw driver and translatory or rectilinear motion when it sinks into the wooden board.

4. Briefly describe random motion with at least two examples.

Ans. The irregular and haphazard motion which moves an object in all possible directions is called a random motion. Two examples of random motion are motion of atoms in a matter and motion of a dry leaf falling from a plant.

F. Give reasons for the following.

1. Motion of an ant is considered as random motion.

Ans. The motion of an ant is considered as random motion because it moves irregularly in all possible directions.

2. Our Earth undergoes two simultaneous movements.

Ans. Our Earth undergoes two simultaneous motions, i.e., rotation and revolution. The circular motion of the Earth on its axis is called rotation while the motion around the Sun on a fixed orbit is called revolution.

G. Skill-based questions.

1. Atul travelled from central Delhi to Noida. He travelled the first 3 kilometres by a rickshaw, the next 27 kilometres by the metro rail and the last 9 kilometres by an autorickshaw. What is the distance between central Delhi and Noida?

Ans.

| | | |
|------------------------------------|---|-------|
| Distance travelled by rickshaw | = | 3 km |
| Distance travelled by metro rail | = | 27 km |
| Distance travelled by autorickshaw | = | 9 km |

$$\begin{aligned}\text{Total distance travelled} &= 3 \text{ km} + 27 \text{ km} + 9 \text{ km} \\ &= 39 \text{ km}\end{aligned}$$

So, the distance between central Delhi and Noida is 39 km.

2. **What is the nature of motion of a girl skipping a rope, if her position on the ground does not change?**

Ans. The girl's motion is nonperiodic motion.

3. **The length of a thread making a complete turn around the rim of each of the two wheels of a cycle is 2 metres. What distance will the cycle move during three complete rotations of the wheels?**

Ans. The circumference of the cycle's wheel = 2 m

So, the distance covered by cycle in one complete rotation = 2 m

∴ The distance covered by cycle in 3 complete rotations = $2 \times 3 \text{ m}$
= 6 m

4. **Write whether the given objects are under rotation or revolution during their functioning.**

(a) Cap of a bottle

(b) A screwdriver

(c) The Moon around the Earth

(d) Wheels of a motorcycle

(e) A key used to open a lock

(f) Mars around the Sun

Ans. (a) Rotation (b) Rotation (c) Revolution
(d) Rotation (e) Rotation (f) Revolution

H. Activity/Project—Do as directed.

Make your own pendulum. Tie a stone to one end of a string. Place the stone at one end and leave it gently. Observe the to-and-fro movement of the pendulum. What kind of motion does it show?

Ans. Do it yourself.

Think Zone

1. **What is the type of motion of a coin on a carrom board?**

Ans. The motion of a carrom coin is random motion.

2. **How can the change in position of an object, with time, help in finding how fast or slow an object is moving?**

Ans. The change in position of an object with time shows its speed. Hence, it helps in finding how fast or slow an object is moving.

Light, Shadow and Images

ANSWERS

Check Point 1

1. Pick the transparent, translucent and opaque substances from the list given below and place them in the desired columns in the given table:

Glass window, Wooden door, Talcum powder, Oil,
Greased paper, Ground glass, Mirror, Mouse pad

| Transparent | Translucent | Opaque |
|--------------|---------------|-------------------|
| Glass window | Ground glass | Wooden door |
| | Oil | Talcum powder |
| | Greased paper | Mirror, Mouse pad |

2. Fill in the blanks:

- (a) A wall is an opaque object.
 (b) Light is allowed to pass through transparent substances.
 (c) A firefly is a natural luminous body.

Check Point 2

1. Fill in the blanks.

- (a) A shadow is a dark region formed due to blocking of light by an opaque object.
 (b) An image is formed due to reflection of light from a smooth and shiny surface.
 (c) A pinhole camera does not use a lens.

2. Write the meaning of the following words.

- (a) Reflection
 (b) Mirror
 (c) Eclipse

- Ans. (a) The change in the direction of path of light after striking an opaque surface is called reflection.
 (b) Mirror is a smooth polished surface which can change the direction of light.
 (c) The total or partial obscuring of light from a celestial body as it passes behind or through the shadow of another body is called eclipse.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- The light travels
 - in a zigzag path
 - in a straight line
 - in dark only
 - through opaque objects
- The place where a shadow is formed is called
 - platform
 - mirror
 - screen
 - window
- During lunar eclipse, the Moon acts as
 - source of light
 - shadow
 - screen
 - camera
- Which one of the following statements is incorrect?
 - Light travels in a straight line.
 - Light is a form of energy.
 - Light is made up of seven colours.
 - The speed of light is 300 m/s.
- Which of these is a luminous object?
 - car
 - tree
 - chair
 - burning candle
- A butter paper is an example of a
 - transparent object
 - translucent object
 - opaque object
 - luminous object
- In a solar eclipse
 - the Earth comes between the Sun and the Moon.
 - the Moon comes in between the Sun and the Earth.
 - the Sun comes in between the Moon and the Earth.
 - none of these.
- Which of these is a correct statement?
 - The objects which allow light to pass through them are opaque.
 - A shadow is cast by transparent objects.
 - The Moon is a nonluminous body.
 - Light does not get reflected from a mirror.

B. Fill in the blanks.

- A luminous object emits light of its own.
- An object which allows light to pass through it is known as a transparent object.
- A shadow is a dark region formed due to blockage of light.
- Reflection from a smooth and shiny surface can form an image.
- A butter paper is an example of a translucent object.
- Different shapes of reflecting surfaces cause images of different shapes and sizes.
- Light travels in a straight line.

C. Match the columns.

| Column A | Column B |
|------------------------|-------------------------|
| 1. Natural luminous | (a) Glass |
| 2. Nonluminous | (b) Ground glass |
| 3. Transparent | (c) Wall (cemented) |
| 4. Translucent | (d) Tubelight (glowing) |
| 5. Artificial luminous | (e) Firefly |

D. Answer in one word.

1. An object which does not emit light of its own. Nonluminous object
2. Unlike shadows, it shows details and colours of the object. Image
3. A ray of light travelling from an object to the mirror. Incident ray
4. A substance that does not allow light to pass through it. Opaque substance
5. Straight line motion of light. Rectilinear propagation

E. Define these terms.

1. Shadow

Ans. A shadow is the darkness that an object causes when it prevents light from falling on another object.

2. Reflection

Ans. Bouncing back of light on striking a highly polished surface is called reflection.

3. Mirror

Ans. A mirror is a smooth and polished surface from where reflection can take place.

4. Light

Ans. Light is a form of energy that helps us to see things around us.

F. Differentiate between the following.

1. Luminous and nonluminous objects

Ans. Objects which emit light are called luminous objects, e.g., the sun, the stars, firefly, etc. On the other hand, objects which do not emit light are called nonluminous objects, e.g., chair, tree, stone, etc.

2. Lunar and solar eclipses

Ans. In lunar eclipse, earth comes between the Sun and the Moon. The shadow of the Earth falls on the Moon and the Moon gets partially or completely blocked for some time, whereas in solar eclipse, the Moon comes between the Sun and the Earth. The shadow of the Moon falls on the Earth and the view of the Sun from shadowed part of the Earth is completely or partially blocked for some time.

3. Opaque and transparent substances

Ans. Substances that do not allow light to pass through them are called opaque substances, e.g., wood, plastic, rubber, etc. On the other hand, substances that allow light to pass through them are called transparent substances, e.g., glass, water, etc.

4. Shadow and image

Ans. A shadow is formed due to the blocking of light by an opaque object while an image is formed due to reflection of light from an opaque, smooth and shiny surface.

G. Answer these questions.

1. How does a solar eclipse occur?

Ans. Solar eclipse occurs when the Moon comes in between the Sun and the Earth. The shadow of the Moon falls on the Earth and the view of the Sun from the shadowed part of the Earth is blocked completely or partially for some time.

2. Explain how the shadow of an object is formed.

Ans. The shadow of an object is formed when the path of light is blocked by it. We can obtain the shadow of an object by performing the following activity:

Hold a torch and let its light fall on a wall. Now, suspend an opaque object like a ball between the wall and the torch. A dark region whose outline resembles that of the ball is formed on the wall. This dark region is the shadow of the ball.

3. Give reason, why the Moon is not called a luminous body.

Ans. The Moon is not a luminous body because it does not have its own light but reflects the light of the Sun falling on it.

4. Which property of light is used in the working of a pinhole camera?

Ans. The rectilinear propagation property of light is used in the working of a pinhole camera.

5. Write four characteristics of a shadow.

Ans. A shadow has following characteristics:

- A shadow is formed only when the light is blocked by an opaque object.
- A shadow is only a dark region, which does not show any colour or the details of the object.
- A shadow may or may not resemble the actual shape of the object.
- A shadow can be formed only on a screen.

6. Write three differences between a shadow and an image.

Ans. Differences between an image and a shadow

| Shadow | Image |
|--|---|
| A shadow does not show the details of the object. | An image shows the exact details of the object. |
| A shadow is formed due to the blocking of light by an opaque object. | The image is formed due to reflection from an opaque, smooth and shiny surface. |
| A shadow is always dark. | The image shows true colours of the object. |

H. Give reasons for the following.

1. The Moon is a nonluminous body though it shines at night.

Ans. Moon is a nonluminous body though it shines at night because it reflects the light of the Sun falling on it.

2. Only opaque objects form shadow.

Ans. Only opaque objects form shadow because they do not allow light to pass through them. They block the path of light falling on them and hence, their shadow is formed.

3. Light gets reflected from a mirror.

Ans. A mirror is a smooth, shiny and an opaque object. It does not allow the light to pass through it. So, when light falls on its, surface, it spreads the light in different directions in a well-defined manner.

I. Encircle the odd-one out. Give reasons for your choice.

1. Water, tree, glass, cellophane paper, air

Ans. Tree: Tree is opaque while others are transparent.

2. Pole, stone, star, table, metal spoon

Ans. Star: Star is a luminous object while others are nonluminous objects.

3. Rock, mirror, gold ring, salt solution, bedsheet

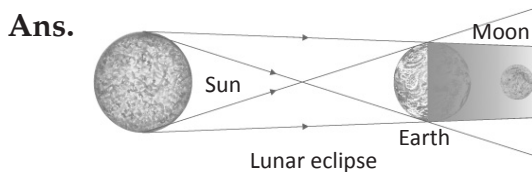
Ans. Salt: solution: Salt solution is transparent while others are opaque.

4. Light, smell, eyes, colours

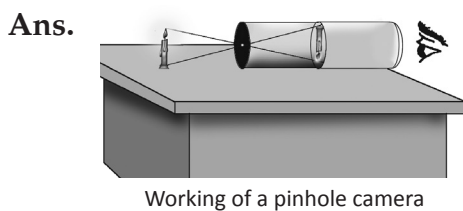
Ans. Smell: Smell is sensed through nose while others are related to eye.

J. Draw and label the diagrams.

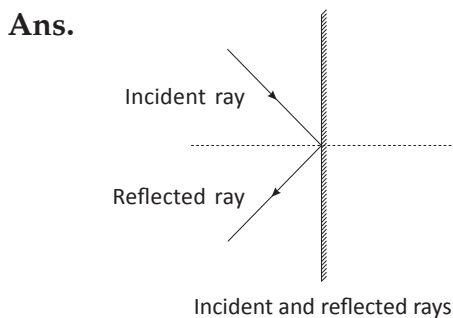
1. Formation of a lunar eclipse



2. Working of a pinhole camera, to form an inverted image of an object



3. A mirror with an incident ray and a reflected ray



K. Skill-based questions.

1. Rearrange the following letters to make meaningful words related to light.

(a) LEEUORCTNFS

(b) TTUCNSNLRAE

Ans. (a) FLUORESCENT

(b) TRANSLUCENT

2. You don't see your image when you stand in front of a clear glass windowpane. Why?

Ans. The clear glass windowpane has no reflecting surface and so the rays falling on it pass through it without going any refraction. That is why we do not see our image in a clear glass windowpane.

L. Activity/Project–Do as directed.

1. Perform an activity to show that light travels in a straight line.

Ans. Do it yourself.

2. Find out what a kaleidoscope is. Make a kaleidoscope and demonstrate its working in the class.

Ans. Do it yourself.

Think Zone

1. You don't see the image of an aeroplane in the sky. Why?

Ans. An aeroplane flying high in the sky does not cast its shadow because the source of light, which is the sun, is million times larger than and the screen, which is the earth's surface, is far away from it. Hence, its shadow does not reach the surface of the earth.

2. What do you understand by the terms the 'New Moon' and 'Full Moon'?

Ans. New Moon is the phase of Moon when the Moon does not appear in the sky. It occurs 15 days after the Full Moon. Full Moon is the phase of Moon when we see a complete Moon in the sky. It occurs 15 days after the New Moon.

PRACTICE TIME

A. MCQs—Choose the correct answers.

- This is a bad conductor of electricity.
(a) gold (b) silver (c) copper (d) rubber
- This is a good conductor of electricity.
(a) plastic (b) wood (c) rubber (d) human body
- A filament of bulb is made of
(a) helium (b) hydrogen (c) tungsten (d) plutonium
- This is not present in dry cell.
(a) zinc container (b) carbon rod
(c) ammonium chloride (d) aluminium
- This power plant uses the heat energy to generate electricity.
(a) hydropower plant (b) thermal power plant
(c) wind energy power plant (d) none of these
- This metal is the best conductor of electricity.
(a) silver (b) gold (c) aluminium (d) copper
- The first source of continuous flow of electricity, cell was devised by
(a) Alessandro Volta (b) Thomas Alva Edison
(c) Sir Isaac Newton (d) Michael Faraday
- Which of the following materials is an insulator?
(a) copper (b) gold (c) silver (d) wood
- Which of the following is a conductor of electricity?
(a) rubber (b) paper (c) graphite (d) plastic
- The combination of two or more cells is called a
(a) torch (b) battery (c) switch (d) circuit

B. Fill in the blanks.

- A dry cell has two terminals.
- The spiral metal structure inside a bulb is called filament.
- An electric circuit is a closed path for the flow of electric current.
- Electric wires are made up of copper coated with plastic.
- If the filament of a bulb breaks, the bulb is said to be fused.

C. Answer in one word.

- A closed path for the flow of electric current. Electric circuit
- A material which does not allow the flow of electric current. Insulator
- A device which can put a circuit on or off. Switch
- The first source of electric current. Voltaic cell
- A type of cell used in satellites. Solar cell

D. Define these terms.

1. Electric switch

Ans. An electric switch is a device which can start or discontinue the working of an electrical device, without disturbing its connections.

2. Electric current

Ans. The flow of electric charge in an electric circuit is called electric current.

3. Insulator

Ans. A material which does not allow the flow of electric current through it is called insulator.

4. Conductor of electricity

Ans. A material which allows the flow of electric current through it is called conductor.

E. Differentiate between the following.

1. Open switch and closed switch

Ans. When the two ends of the switch are disconnected, it is called an open switch, whereas when the two ends of the switch are connected to each other, it is called a closed switch.

2. An electric cell and electric power plant

Ans. An electric cell is the source of electric current which can provide small amount of current continuously for limited period of time, whereas an electric power plant generates electricity on a large scale and can supply electric current for a longer time.

F. Answer these questions.

1. Why do the electrical appliances and tools have their handles covered with insulating materials?

Ans. The electrical appliances and tools have their handles covered with insulating materials so that the user may not get electric shock while working with them.

2. State four precautions that one must follow while handling electricity.

Ans. Following precautions should be taken while handling electricity:

(a) Never play with sockets or electric wires.

(b) Never touch an electric switch, plug or device with wet hands or barefoot.

(c) Always wear dry rubber slippers or stand on a dry wooden or plastic base while using an electrical appliance.

(d) In case of a short circuit or a spark in a switch, put it off immediately with the help of a plastic or wooden stick.

3. Give some uses of electric conductors.

Ans. Conductors of electricity are used for making electric wires, switches, plugs, sockets and inner parts of electrical devices.

4. State three uses of insulators.

Ans. (a) Insulators like rubber and plastics are used to cover electric wires, handles of metal tools, electrical appliances, etc., to save the user from electric shocks.

(b) Electricians use rubber gloves for safeguard while working with electric devices and circuits.

(c) The workers in industries and factories who operate heavy electrical machines are provided with rubber footmats to stand upon and rubber gloves for safe working.

5. What will happen if the connecting wire breaks down, while a device is working?

Ans. If the connecting wire of an electric circuit breaks down, the flow of electric current will stop in the circuit and this will put the device off.

6. What are the important parts of a circuit used to make a bulb glow?

Ans. The important parts of a circuit are a cell, a switch or key and electric wires.

G. Encircle the odd-one out and give reasons for your choice.

1. Thermocol, dirty water, moist air, aluminium, silver

Ans. Thermocol: Thermocol is an insulator while others are conductors of electricity.

2. Pure water, dry wood, plastic scale, iron nail

Ans. Iron nail: Iron nail is conductor of electricity while others are insulators.

3. Solar cell, storage cell, hydropower plant, button cell, dry cell

Ans. Hydropower plant: Hydropower plant produces electricity at a large scale while others a small amount of electricity.

H. Skill-based question.

An electrician working with electric connections, often holds one of the two electric wires connected to an electric socket, having electric current in it. He is not harmed in any way. Give reason.

Ans. An electrician always uses insulated shoes, gloves and pliers. Due to insulated shoes or gloves his body is not earthed and the electric circuit through the body is not complete. Hence, electric current does not flow through his body and he is not harmed.

I. Activity/Project–Do as directed.

Perform an activity to show that a closed circuit is compulsory for a bulb to glow.

Ans. Do it yourself.

Think Zone

1. Human body is a good conductor. Can you think, why?

Ans. Human body is a good conductor of electricity because it contains several ions like sodium, calcium, chloride, magnesium, etc. inside it. These ions conduct electricity through the body.

2. What is an electric shock?

Ans. When any of our body parts is touched with a live wire, the passage of electric current through our body causes sudden heating of body organs and muscles. This phenomenon is known as an electric shock.

3. What actually happens inside a human body when it receives an electric shock?

Ans. When a human body receives an electric shock, the electric current starts flowing through the body. The resistance of the body causes the tissues to heat up and hence tissue damage is caused.

ANSWERS

Check Point 1

1. State two examples each of:

- (a) magnetic material
- (b) nonmagnetic material

Ans. (a) Nickel; cobalt
(b) Paper; cotton

2. Give one word for the following.

- (a) an object that can attract iron and nickel.
- (b) a magnet made by man.
- (c) naturally found magnetic material.

Ans. (a) Magnet
(b) Artificial magnet
(c) Magnetite (lodestone)

Check Point 2

1. Fill in the blanks.

- (a) Every magnet has its power stored in its poles.
- (b) If suspended freely, a magnet always points in north-south direction.
- (c) Like poles of magnets repel each other.

2. State any two properties of magnets.

Ans. (a) Magnets have two poles—north pole and south pole.
(b) A magnet when suspended freely from its centre always comes to rest with its poles pointing in north-south direction.

Check Point 3

1. What precautions should be followed while handling magnets? List three of them.

Ans. The precautions to be followed while handling magnets are:

- (a) Do not heat a magnet.
- (b) Don't throw or let it fall on the floor.
- (c) Never hit or beat a magnet with anything.

2. For every magic activity that you conducted, state which property of magnets is being used.

Ans. Magic Activity 1–Attraction

Magic Activity 2–Attraction

Magic Activity 3–Like poles of two magnets repel each other, i.e., repulsion.

PRACTICE TIME

A. MCQs–Choose the correct answers.

- A freely suspended bar magnet will always come to rest in the
 - north-east direction
 - east-west direction
 - south-east direction
 - north-south direction
- A south pole will repel
 - a south pole
 - a north pole
 - both south and north poles
 - neither south pole nor north pole
- A magnet will not attract
 - an iron blade
 - an iron pin
 - a wire of aluminium
 - a key of nickel
- A force that pushes away something is called
 - repulsion
 - attraction
 - action
 - friction
- The power of a magnet is concentrated at its
 - centre
 - poles
 - sides
 - whole surface
- Which of the following is not a magnetic material?
 - iron
 - nickel
 - gold
 - cobalt
- 'Keepers' for storing magnets are made of
 - soft iron
 - steel
 - aluminium
 - copper

B. Write *True* or *False* against each statement.

- Magnetite is a man-made magnet. False
- Like poles repel each other. True
- Gold is a nonmagnetic substance. True
- The poles of a magnet have no magnetic power. False
- Magnetic power of a magnet increases by heating it. False

C. Answer in one word.

- What is the process of losing magnetic power by a magnet called? Demagnetisation
- Name a substance which is used to make good permanent magnets. Alnico
- Name one magnetic material. Nickel
- Name one nonmagnetic material. Silver
- Name one natural magnet. Magnetite
- Where is the power of a magnet concentrated? Poles of the magnet

D. Differentiate between the following.

1. Natural and artificial magnets

Ans. The magnet found in nature is called natural magnet. It is formed of oxides of iron. The natural magnet cannot be given the desired shape. On the other hand, the magnet prepared from pieces of iron is called artificial magnet. An artificial magnet can be given a desired shape as may be required for a particular use.

2. Magnetic and nonmagnetic materials

Ans. Materials which are attracted by magnets are called magnetic materials, e.g., iron, nickel, cobalt and their alloys. On the other hand, materials which are not attracted by magnets are called nonmagnetic materials, e.g., wood, plastic, paper, cotton, glass, copper, aluminium, etc.

E. Answer these questions.

1. How was magnet discovered?

Ans. Magnet was discovered by-chance by a shepherd named Magnes. One day, he was herding his sheep and found the nails in his shoes and the metal tip of his stick stuck to a large black rock on which he was standing. Later, this type of rocks was named as magnetite.

2. How can a magnet be demagnetised?

Ans. A magnet can be demagnetised by heating it to very high temperature, by hammering or by bringing into contact with other magnets repeatedly.

3. Describe an activity to show that magnets can be helpful in finding directions.

Ans. Tie a bar magnet at one end of a 25–30 cm long thread and suspend it from a wooden stand. Allow the magnet to come at rest. Meanwhile, mark the directions on a piece of paper and place it on the base of stand, with its centre just below the magnet. The bar magnet comes to rest with its poles pointing in the north-south direction.

4. How can you make a magnet? Explain.

Ans. To make a magnet, we need a bar magnet and a small iron rod.

Make the iron bar lie on a table. Hold a bar magnet vertically at one end of the iron bar, so that one of the poles of the magnet (say N-pole) touches the iron bar. Rub the magnet along the length of the iron bar, till you reach its other end. Lift the magnet vertically and bring it back to the previous end such that the same pole touches the iron bar again.

Repeat the process at least 40–50 times. The iron bar gets magnetised. It can be tested by bringing small iron pins near it.

5. How should we store bar magnets when they are not in use?

Ans. When bar magnets are not in use, they should be stored in pairs with their poles opposite to each other using magnetic keepers.

F. Give reasons for the following.

1. Magnets should be kept away from things like television, radio, etc.

Ans. The functioning of electrical and electronic devices gets affected in the presence of magnets. Therefore, magnets should be kept away from things like television, radio, etc.

2. Magnets should be handled carefully.

Ans. Magnets should be handled carefully because if they are dropped frequently, hammered, heated or brought into contact with other magnets repeatedly, they lose their magnetism and become demagnetised.

G. Encircle the odd-one out. Give reasons for your choice.

1. Cotton, wood, plastic, iron, glass

Ans. Iron: Iron is a magnetic material while others are nonmagnetic materials.

2. Iron, cobalt, silver, nickel, ALNICO

Ans. ALNICO: ALNICO is an alloy while others are metals.

H. Skill-based question.

Himanshu performed an activity as follows:

He took a small needle-shaped magnet. He pierced it through a small piece of cork and allowed this cork with the needle to float in water in a plastic tub. He left the tub undisturbed for a short while and then observed that the direction in which the needle came to rest was the north-south direction.

He performed the same activity again and again. In which direction the needle must have come to rest each time and why?



Ans. The magnetic needle must have come to rest in the north-south direction each time because a freely suspended bar magnet always tends to rest in the north-south direction.

I. Activity/Project–Do as directed.

Perform an activity to show that like poles repel each other and unlike poles attract each other.

Ans. Do it yourself.

Think Zone

1. How do maglev trains manage to run without touching the ground?

Ans. Maglev trains make use of large and powerful electromagnets. The magnetic force produced by these electromagnets lifts the train a little above the magnetic track and the train moves ahead. Thus, maglev trains run without touching the ground.

2. What are the directions of the Earth's magnetic north pole and south pole?

Ans. The earth's magnetic north pole lies near the geographical south pole and magnetic south pole lies near the geographical north pole.

3. Device at least one magical item other than those given in the chapter and explain its working.

Ans. To make the matchbox move on your will.

Take a bar magnet and hide it inside an empty matchbox. Take another bar magnet and hold it in your fist such that it is not visible to others.

Now, put the matchbox on a table and move your fist around it and see how the matchbox moves with your hand. This happens due to magnetic property.

ANSWERS

Check Point 1

1. How much of the earth's surface is covered by oceans and seas?

Ans. About three-fourths

2. Why do plants need water?

Ans. Plants need water to carry out life activities. For example, to germinate their seeds, to make their food, to grow, etc.

3. How is rainwater different from sea water?

Ans. The sea water is saline. It contains high amount of salts. The rainwater is pure and not saline. It may be used in washing clothes and also for bathing.

4. Where does most of the water we use in our homes come from?

Ans. Rainwater.

Check Point 2

1. What does water turn into when it is heated?

Water vapour

2. What does water turn into when it is cooled?

Ice

3. What do we say has happened when water disappears into the air?

Evaporation

4. What are steam, cloud, dew and fog made of?

Water vapour

5. Fill in the blanks.

(a) Evaporation takes place at all temperatures.

(b) Water vapour condenses into tiny droplets of water.

(c) Flood can lead to landslides.

(d) Dehydration and other related diseases are common during drought.

PRACTICE TIME

A. MCQs—Choose the correct answers.

1. How much of the earth's surface is covered with water?

(a) one-fourth (b) half (c) three-fourths (d) none of these

2. Rate of evaporation

(a) is faster when water is cooled (b) is faster when water is heated

(c) slows down when water is heated (d) does not depend on temperature

3. Floods can lead to
 - (a) loss of crops
 - (b) unhygienic conditions
 - (c) scarcity of drinking water
 - (d) all of these
4. Which of the following is a way of conserving water?
 - (a) using a shower for bathing rather than a bucket
 - (b) letting the water run while brushing your teeth
 - (c) turning off the tap immediately after use
 - (d) flushing the toilets unnecessarily
5. Which of these processes is not responsible for the presence of water vapour in the air?
 - (a) transpiration
 - (b) condensation
 - (c) evaporation
 - (d) respiration
6. Large drops of water fall down on the earth in the form of
 - (a) stones
 - (b) clouds
 - (c) rain
 - (d) leaves
7. As water vapour rises higher and higher, it gets
 - (a) hotter
 - (b) cooler
 - (c) warmer
 - (d) none of these
8. Flood causes great damage to
 - (a) crops
 - (b) animals
 - (c) humans
 - (d) all of these
9. Transpiration is the process of
 - (a) absorbing water by plants
 - (b) seeping of rainwater under the ground
 - (c) making food by green plants
 - (d) loss of water by plants in vapour form

B. Fill in the blanks.

1. Evaporation of water takes place at all the temperatures.
2. Plants lose water from their leaves by the process of transpiration.
3. Water vapour enters the air through the processes of transpiration, evaporation and respiration.
4. Heavy rains may lead to floods.
5. About three-fourths of the earth's surface is covered with water.
6. We need to conserve water.

C. Write True or False against each statement.

1. We do not need to conserve water as it is available in plenty in oceans and seas. False
2. The process of evaporation brings the water back to the earth. True
3. About two-thirds of the earth's surface is under water. False
4. River water is as saline as sea water. False
5. The loss of water by plants in the form of water vapour is called condensation. False
6. Droughts lead to the drying up of soil. True

D. Answer in one word.

1. Continuous circulation of water from the earth's surface into air and from air back to the earth's surface. Water cycle
2. The release of water vapour by plants and animals. Respiration
3. The condensed water vapour in the form of tiny droplets. Clouds
4. A condition caused when it does not rain in a region for a long time. Drought
5. A method of collecting and storing rainwater for future use. Rainwater harvesting

E. Differentiate between the following.

1. Drought and flood

Ans. A long period of low or no rainfall is called drought, whereas submerging of land due to heavy rains causing the water level of lakes, ponds and rivers to rise is called flood.

2. Evaporation and condensation

Ans. The change of water into water vapour is called evaporation, whereas the change of water vapour into tiny droplets of water is called condensation.

F. Answer these questions.

1. Give three uses of water.

Ans. (a) We use water for drinking, cooking, cleaning, washing, etc.

(b) Water is used in agriculture for irrigating crops.

(c) In industries, water is used for cleaning, heating, cooling, generating electricity, etc.

2. What is meant by rainwater harvesting?

Ans. The collection and storing of rainwater for future use is called rainwater harvesting.

3. Water spilled on the floor disappears after some time. Why?

Ans. Water spilled on the floor disappears after some time because of evaporation.

4. Name the processes by which water vapour enters the air.

Ans. Water vapour enters the air through the processes of transpiration, evaporation and respiration.

5. Explain water cycle. Does condensation play any role in water cycle?

Ans. The continuous circulation of water from the earth's surface to the air and from the air back to the earth's surface is called water cycle.

Yes, condensation plays important role in water cycle. Water vapour changes into tiny droplets of water forming clouds by the process of condensation. In this way, condensation helps to bring water back to the Earth.

6. What is the role of plants in water cycle?

Ans. Plants release water vapour into the atmosphere by the process of transpiration and help in water cycle.

7. Explain the methods of rainwater harvesting.

Ans. Rainwater harvesting is done by collecting and storing rainwater in tanks for future use or by allowing rainwater to seep into the ground directly for recharging groundwater which can be used later through wells and tubewells.

8. How does a drought occur? List five effects of drought.

Ans. Drought occurs when it does not rain for a long time in a region.

Effects of drought:

- (a) Crop-yield becomes less and soil dries up.
- (b) Water shortage leads to death of people and livestock.
- (c) Food and fodder become scarce which leads to malnutrition.
- (d) Dehydration and other related diseases breakout in the drought-hit area.
- (e) Migration of people from drought-hit area puts economic pressure on nondrought areas.

9. How do floods occur? List five effects of floods.

Ans. Floods occur due to continuous heavy rain for many days. This causes the water levels of lakes, ponds and rivers to rise.

The harmful effects of floods are as follows:

- (a) Floods cause great damage to crops, animals, human life and buildings.
- (b) Flood can lead to landslides.
- (c) People and animals may drown in flood water and die.
- (d) Flood can cause shortage of food as crops get destroyed.
- (e) Unhygienic conditions caused due to flood can lead to spread of waterborne diseases like cholera and typhoid.

10. List five ways by which water can be conserved.

Ans. (a) Use minimum amount of water for bathing. Use a bucket instead of a shower.
(b) Do not let water run while brushing, shaving or washing your hands or face.
(c) Make sure that your house has no leaky taps.
(d) Turn off the taps immediately after use.
(e) Adopt rainwater harvesting.

11. Describe an activity to show that water open in the air forms water vapour.

Ans. Take a plate and make a mark on it with a sketch pen. Fill water in the plate up to the mark. Now, leave the plate undisturbed in an open space for 3–4 hours. Observe water in the plate. You will see that the level of water has fallen down the mark.

This shows that water left in open air forms water vapour.

G. Give reasons for the following.

1. We need to conserve water.

Ans. We need to conserve water so as to fulfil the demand of water of increasing population of the world.

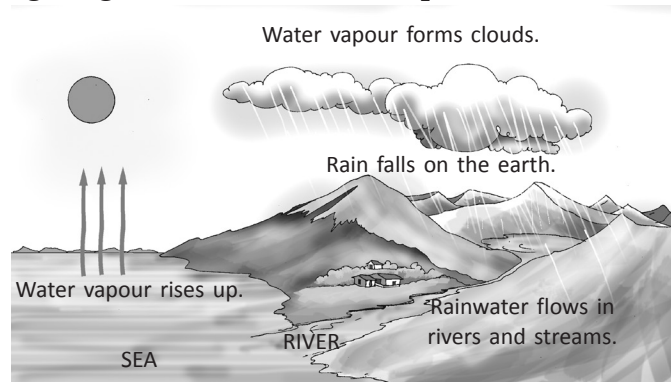
2. Sea water cannot be directly used for drinking and agricultural purposes.

Ans. Sea water has lots of salts dissolved in it which make it unfit for drinking and growing of plants.

3. Storage tanks used to store rainwater must have a tight cover.

Ans. Storage tanks used to store rainwater must have a tight cover to prevent the spoilage of water as well as the breeding of mosquitoes.

H. Look at the following diagram and answer the questions.



- 1. Name the process that causes the formation of clouds.**

Ans. Condensation

- 2. Name the process that causes the formation of water vapour.**

Ans. Evaporation

- 3. At which stage of water cycle, is water in the purest form?**

Ans. Water is in the purest form when it condenses to form water droplets.

- 4. Is water in the rivers more saline than the water in seas and oceans?**

Ans. No. In fact, sea or ocean water is more saline. The rivers flowing into seas bring a large amount of salts with them which make the sea water saline.

I. Skill-based questions.

- 1. Sea water is highly saline and cannot be used for growth of plants or for drinking by animals. But rainwater can be used for the growth of plants and for drinking by animals. Why?**

Ans. Sea water has lots of salts dissolved in it which makes it unfit for drinking and growing of plants. Rainwater can be used for the growth of plants and for drinking by animals as rainwater is the purest form of water.

- 2. Why do puddles on roads and playgrounds soon dry up when the sun comes out?**

Ans. Puddles on roads and playgrounds dry up when the sun comes out as the rate of evaporation of water increases with the increase in temperature.

- 3. Puddles on roads dry up on a cloudy day also. Why is it so?**

Ans. Puddles on roads dry up on a cloudy day also because evaporation of water takes place at all temperatures.

- 4. Water cycle helps in keeping the amount of water on the earth's surface constant. How?**

Ans. This is because of the continuous circulation of water from the earth's surface to air and from the air back to the earth's surface.

J. Activity/Project-Do as directed.

- 1. Perform an activity to show that rate of evaporation is higher at higher temperature.**

Ans. Do it yourself.

- 2. Demonstrate an activity to show that air contains water vapour.**

Ans. Do it yourself.

3. **Collect articles or pictures related to water scarcity from old newspapers, magazines or internet. Paste them on a chart paper. Bring information on how water scarcity is affecting the condition of people in various parts of our country. Share your information in the class and have a discussion on it.**

Ans. Do it yourself.

Think Zone

1. **Have you ever seen vapour trail being produced by a high flying aircraft?**

Can you think of the reason for the formation of this vapour trail?

Ans. The water vapour made by the exhaust of aircraft engines condenses as the temperature higher up is very low. This condensed water vapour is seen in the form of vapour trail.

2. **When you breathe out on a very cold winter morning, you can see your breath in the form of a cloud. Why?**

Ans. When we breathe out, water vapour present in our breath condenses due to the low temperature in our surroundings. This condensed water vapour is seen in the form of a cloud.

ANSWERS

Check Point 1

Answer the following questions.

1. List two instances which make you feel the presence of air.

Ans. (a) We feel air when leaves of plants rustle.
(b) We feel air when our hair ruffle.

2. Which gas is the biggest component of air?

Ans. Nitrogen

3. What is the percentage of following gases in the air?

(a) oxygen (b) nitrogen (c) carbon dioxide

Ans. (a) 21% (b) 78% (c) 0.03%

4. Does the amount of water vapour in air remain fixed?

Ans. No

5. Name all the components of air.

Ans. Nitrogen, oxygen, noble gases, carbon dioxide, water vapour, smoke and dust particles.

Check Point 2

1. Name the component of air:

(a) which helps in burning.

Oxygen

(b) which is used to make fertilisers.

Nitrogen

(c) which can extinguish fire.

Carbon dioxide

2. Name the gas used by green plants to manufacture their food.

Carbon dioxide

3. Name the gas released by green plants during the process of making of their food.

Oxygen

Check Point 3

State whether the following statements are *true* or *false*.

1. Animals living in soil take air present in soil for respiration.

True

2. All fuels burn in the presence of carbon dioxide.

False

3. Windmills are used to generate electricity.

True

4. Air helps in the dispersal of seeds.

True

PRACTICE TIME

A. MCQs—Choose the correct answers.

- Which gas do mountaineers carry in their cylinders?
(a) nitrogen (b) oxygen
(c) carbon dioxide (d) none of these
- Air is used for
(a) separating husk from grains (b) flying by birds
(c) dispersal of seeds (d) all of these
- The oxygen present in the air is used for
(a) respiration (b) extinguishing fire
(c) burning (d) both (i) and (iii)
- The percentage of which gas found in air is incorrect?
(a) oxygen—21% (b) nitrogen—87%
(c) noble gases—0.95% (d) carbon dioxide—0.03%
- Which two main processes maintain the balance of carbon dioxide and oxygen in the atmosphere?
(a) photosynthesis and burning (b) burning and respiration
(c) respiration and photosynthesis (d) none of these
- Which gas present in air is used by plants for making food through photosynthesis?
(a) oxygen (b) carbon dioxide
(c) nitrogen (d) noble gases
- Which gas is released by green plants during the process of making their food?
(a) oxygen (b) carbon dioxide (c) nitrogen (d) noble gases
- Which gas(es) present in the air does not support burning?
(a) oxygen (b) nitrogen
(c) carbon dioxide (d) nitrogen and carbon dioxide
- Which of these gases is present in the least quantity in air?
(a) oxygen (b) carbon dioxide
(c) nitrogen (d) none of these

B. Fill in the blanks.

- Nitrogen gas present in the air is used to make fertilisers.
- The thick layer of air surrounding the earth is called atmosphere.
- In coastal areas, water vapour has greater percentage in air.
- The carbon dioxide gas present in air is used by plants for making food through photosynthesis.
- The dust particles can be seen floating in a beam of light in a darkroom.
- The oxygen present in air is used for breathing and burning.

C. Write True or False against each statement.

1. Carbon dioxide gas is necessary for burning. False
2. Since all living beings take in oxygen for respiration, the amount of oxygen gas in the air will finish off soon. False
3. Soil contains air. True
4. Earthworms are called enemies of farmers. False
5. We should breathe air from our mouth. False

D. Answer in one word.

1. Most abundant gas present in air. Nitrogen
2. The percentage of this gas in the air is 21%. Oxygen
3. Aquatic animals take in this gas dissolved in water. Oxygen
4. The process by which oxygen gas is released in the air. Photosynthesis
5. The moving air is known by this name. Wind

E. Define these terms.

1. Respiration

Ans. Respiration is the process of taking in oxygen by living organisms and combining it with food to release energy and carbon dioxide.

2. Photosynthesis

Ans. Photosynthesis is the process by which green plants make their food in the presence of sunlight using carbon dioxide and water.

F. Answer these questions.

1. What is the composition of air?

Ans. The air consists of 78% nitrogen, 21% oxygen, 0.03% carbon dioxide, 0.95% noble gases, water vapour, dust particles and smoke.

2. Give any three uses of air.

Ans. (a) Air is used by living beings for respiration.
(b) Air helps aeroplanes, helicopters, etc., to move.
(c) Air helps to separate husk from grains by winnowing.

3. Give the percentage of the gases oxygen and nitrogen in the air.

Ans. The percentage of oxygen is 21% and that of nitrogen is 78%.

4. How will you show that oxygen is required for burning?

Ans. Take a deep bowl and fix a small candle in its centre. Add some coloured water to the bowl. Lit the candle. Invert a glass jar over it. Observe the burning candle and level of water inside the glass jar. The candle extinguishes after burning for some time and the water level rises in the glass jar. This is due to the presence of limited amount of oxygen inside the glass jar which keeps the candle burning till it is used up. The space occupied by oxygen is taken by the water. This is indicated by rise in water level inside the glass jar.

This activity shows that oxygen gas is required for burning.

5. Is the amount of water vapour constant in the air?

Ans. The amount of water vapour present in the air is not fixed. It varies from place to place. In coastal areas, the air has greater percentage of water vapour.

6. How can you show that soil contains air?

Ans. The presence of air in soil can be shown by adding water to dry soil. When water is added to dry soil, air comes out in the form of bubbles. This shows that soil contains air.

7. How can you show that air is dissolved in water?

Ans. Take some water in a beaker or a glass vessel. Ask an elder to heat it. You will see some bubbles on the inner surface of the beaker.

These bubbles come from the air which is dissolved in water. This activity shows that air is dissolved in water.

8. How is the balance of oxygen and carbon dioxide maintained in the atmosphere?

Ans. The balance of oxygen and carbon dioxide is maintained in the atmosphere by the processes of respiration and photosynthesis. All living beings breathe in oxygen by taking it from air and breathe out carbon dioxide. Green plants take in carbon dioxide from air, use it in the process of photosynthesis and release oxygen gas into the air. Thus, a balance between two gases is maintained.

9. Give three uses of windmill.

Ans. Windmills are used to generate electricity, draw water from tubewells and also to run flour mills.

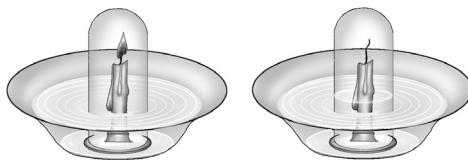
10. How do aquatic animals get oxygen gas required for breathing?

Ans. Aquatic animals get oxygen dissolved in water for breathing.

11. Is carbon dioxide important for plants? How?

Ans. Yes, carbon dioxide is important for plants because it is used by plants in the process of photosynthesis for making their own food.

12. Look at the given figures and answer the questions.



(a) Which gas helps the candle in burning — nitrogen, oxygen or carbon dioxide?

(b) Give any one use of this gas, other than burning?

(c) Will the candle continue burning for long? Why/Why not?

(d) What causes the water to rise up in the jar?

(e) What is the name of the main gas left in the jar?

Ans. (a) Oxygen.

(b) All living organisms use oxygen for respiration.

(c) No, the candle will not continue burning for long as there is limited amount of oxygen inside the glass jar.

(d) The space occupied by oxygen is taken up by the water as the oxygen is used up in burning. This raises the water in the jar.

(e) Nitrogen.

G. Encircle the odd-one out and give reasons for your choice.

1. **Oxygen, carbon dioxide, nitrogen, air, water vapour**

Ans. Air: Air is a mixture of gases, while others are gases.

2. **Respiration, burning, photosynthesis**

Ans. Burning: Burning is a process of releasing energy which can occur anywhere while others are life processes that occur in the body of living beings only.

H. Give reasons for the following.

1. **Mountaineers carry oxygen cylinders with them.**

Ans. The amount of oxygen present in the air becomes less and less as we move higher. That is why, mountaineers carry oxygen cylinders with them while climbing high mountains so that they can breathe easily.

2. **Nitrogen gas is used in packaging of food.**

Ans. Nitrogen gas is used in packing of food because it does not allow the growth of bacteria and moulds that spoil the food and keeps the food fresh for longer period of time.

3. **Carbon dioxide is used in fire extinguishers.**

Ans. Carbon dioxide does not support burning. Therefore, it is used in fire extinguishers.

4. **Factories have tall chimneys.**

Ans. Factories produce smoke which contains harmful substances and gases. The tall chimneys in factories expel the smoke high and far away from us.

5. **We should breathe from our nose and not from the mouth.**

Ans. We have fine hair and sticky mucus inside our nose. They act as filter. When we breathe in air, they trap dust particles present in the air and do not allow them to enter our body. On the contrary, if we breathe from our mouth, the dust particles present in breathed air will enter our body and harm us.

6. **Earthworms are called friends of farmers.**

Ans. Earthworms turn out the soil by moving in and out and make it airy. Their excreta adds nutrients to the soil. Thus, soil becomes airy and fertile which is good for plants to grow.

I. Skill-based questions.

1. **What do you think is filled in the cylinder which this diver is carrying? Give reason.**

Ans. Oxygen gas is filled in the cylinder which the diver is carrying. This helps the diver to breathe easily when underwater.



2. **What do you think is filled in the cylinder which an astronaut carries with?**

Ans. Oxygen gas is filled in the cylinder which an astronaut carries with him.

3. **Why do we not run out of oxygen?**

Ans. We never run out of oxygen because oxygen gas is continuously added into the air by the process of photosynthesis.

J. Activity/Project–Do as directed.

- 1. Perform an activity to show that a glass bottle which seems to be empty, is actually filled with air.**

Ans. Do it yourself.

- 2. Perform an activity to show that carbon dioxide gas can extinguish fire.**

Ans. Do it yourself.

Think Zone

- 1. List some more examples except those mentioned in the chapter, when you can feel the presence of air.**

Ans. (a) Fluttering of a calendar

(b) Swaying of curtains

- 2. A layer of a gas present in the atmosphere protects us from sun's harmful rays. Can you name this gas?**

Ans. Ozone gas.

- 3. Air contains noble gases in very small amounts. What are noble gases? Can you name any two noble gases?**

Ans. Noble gases are unreactive gases. Helium and argon are noble gases.

- 4. What do you think happens when there is too much water vapour in the air?**

Ans. When there is too much water vapour in the air, it causes humidity.

ANSWERS

Check Point 1

Choose the correct words to fill in the blanks.

1. Nontoxic waste is harmless. (nontoxic/liquid)
2. Kitchen waste is a domestic waste. (industrial/domestic)
3. The waste which is harmful to human beings, animals and plants is called toxic waste. (toxic/community)
4. Plastic is nonbiodegradable waste. (biodegradable/nonbiodegradable)
5. The conversion of organic waste into manure by microorganisms is called composting. (composting/sludging)

Check Point 2

1. Give full forms:

- (a) NGO (b) WMC (c) CFC (d) CNG

- Ans. (a) Non-Governmental Organisation (b) Waste Minimisation Centres
(c) Chlorofluorocarbons (d) Compressed Natural Gas

2. What does the three Rs stand for in waste management?

Ans. Reduce, Recycle and Reuse

3. Give two main disadvantages of landfill procedure of solid waste disposal.

- Ans. (a) Solid waste like plastic is nonbiodegradable which is not decomposed and harms the surroundings.
(b) Solid waste deposited in the landfill attracts flies, rats and worms and produces a foul smell.

4. Give any two examples of recycling of waste.

- Ans. (a) Recycling of paper (b) Recycling of glass

PRACTICE TIME

A. MCQs—Choose the correct answers.

1. Which of the following is responsible for the increase in waste generation?
 - (a) increase in population
 - (b) increase in urbanisation
 - (c) modern lifestyle
 - (d) all of these

2. Vehicular air pollution can be reduced by using
 (a) diesel (b) petrol (c) CNG (d) all of these
3. Liquid waste disposal does not involve
 (a) landfills (b) sewer lines (c) septic tanks (d) sewage plants
4. Landfills deteriorate surroundings by
 (a) polluting air (b) polluting water
 (c) attracting flies and insects (d) all of these
5. This is organic waste which gets decomposed in few days.
 (a) compost (b) vermicompost (c) garbage (d) sewage
6. Biodegradable waste includes
 (a) lead (b) mercury (c) tin (d) rotten fruits
7. Nonbiodegradable waste includes
 (a) dead plants (b) metallic compounds
 (c) animal excreta (d) peels of vegetables
8. Garbage can be used for
 (a) generating electricity (b) generating cooking gas
 (c) producing compost (d) all of these

B. Fill in the blanks.

1. Recycling is the use of waste materials by changing their form.
2. Sewage tanks form the most suitable domestic waste water treatment system.
3. Polluted water is hazardous for plants, aquatic life and human beings.
4. CFCs used in refrigerators and air conditioners are harmful for ozone layer.
5. Landfills cause pollution of land.

C. Write True or False against each statement.

1. Empty plastic bottles and polythene bags cannot be used again. False
2. Nonbiodegradable waste is hazardous to mankind. True
3. Biodegradable waste is used for composting. True
4. Paper, plastic, polythene bags and broken glass pieces form garbage. False
5. Urban waste can be recycled but not the rural waste. False
6. Air pollution affects growth of plants. True

D. Answer in one word.

1. Using the waste material again and again. Reuse
2. Use of worms for decomposing garden and kitchen waste. Vermicomposting
3. Machines used to burn hospital waste at high temperature. Incinerator
4. Liquid waste from kitchen and toilets. Sewage
5. The solid waste obtained from the treatment of liquid waste. Sludge

E. Define these terms.

1. Pathogenic waste

Ans. The waste containing disease-causing microbes is called pathogenic waste.

2. Municipal solid waste

Ans. The solid waste in urban areas managed by municipal authorities is called municipal solid waste.

3. Biomedical waste

Ans. The waste generated in hospitals, clinics and pathological laboratories is called biomedical waste.

4. Sludge

Ans. The solid waste separated from the liquid waste during the waste water treatment is called sludge.

F. Differentiate between the following.

1. Biodegradable and nonbiodegradable waste

Ans. The waste which is decomposed by microorganisms into simpler compounds is called biodegradable waste, e.g., animal and plant waste, paper, peels of fruits and vegetables, old clothes, etc. On the other hand, the waste which is not decomposed by microorganisms is called nonbiodegradable waste, e.g., metals, detergents, paints, chemical waste, polythene bags, plastics, etc.

2. Recyclable and nonrecyclable waste

Ans. The waste from which new useful things can be made is called recyclable waste. For example, glass, paper, plastics, etc.

The waste from which new useful things cannot be made is called nonrecyclable waste. For example, rags, organic waste, etc.

3. Hazardous and nonhazardous waste

Ans. The waste which pollutes air, water and soil and causes health problems in man and animals is called hazardous waste. For example, waste from industries, hospitals, etc.

The waste which is harmless to man, plants, animals and their environment is called nonhazardous waste. For example, waste from houses, schools, etc.

4. Pathogenic and nonpathogenic waste

Ans. The waste containing disease-causing microbes is called pathogenic waste.

The waste which does not contain disease-causing microbes is called nonpathogenic waste. For example, waste obtained from houses, schools, offices, etc.

G. Answer these questions.

1. Give five hazards of waste accumulation.

Ans. Hazards of waste accumulation:

(a) Accumulated waste causes pollution of soil, water and air.

(b) Waste accumulation generates foul odour.

(c) Accumulation of leftover construction material and garbage may cause accidents.

(d) Diseases like gastroenteritis, diarrhoea, cholera, jaundice, typhoid, etc. are caused by polluted or contaminated water.

(e) Accumulated garbage contains leftover food and worms. These attract birds. A bird may hit an aircraft causing it to crash.

2. Name any four air pollutants.

Ans. Carbon monoxide, chlorofluorocarbons (CFC), sulphur dioxide and ammonia.

3. Enumerate problems caused by the use of plastic objects.

Ans. (a) Plastic objects such as polyethene bags, etc. clog the soil and make it barren.

(b) They choke drains and damage the municipal sewage system.

(c) Plastic bags accumulated in garbage are responsible for death of stray animals. Cattle eat left over food, etc. from garbage and consume plastic bags along with the food. This chokes their stomach and causes death.

(d) Plastic dumped in water bodies causes death of aquatic animals like fish, turtle, etc.

4. What are the environmental hazards of chlorofluorocarbons? What are their sources?

Ans. Chlorofluorocarbons are responsible for the depletion of ozone layer in the atmosphere. This allows harmful ultraviolet rays of the Sun to reach the Earth's surface.

Chlorofluorocarbons are released by refrigerators and air-conditioners.

5. Give advantages of composting.

Ans. By composting, waste is converted into humus which can be used as manure for the plants. Thus, waste is disposed off in a harmless way.

6. Name the three Rs that can help in managing wastes.

Ans. The three Rs are Reduce, Reuse and Recycle.

7. Categorise recyclable, reusable, biodegradable and nonbiodegradable wastes from the list:

Wood pieces, empty ink bottles, broken ceramics, newspapers, earthen pots, rotten fruits, cotton cloth, rusted iron nails.

Ans. Recyclable — Newspapers, Reusable — Empty ink bottles,

Biodegradable — Wood pieces, earthen pots, rotten fruits, cotton cloth,

Nonbiodegradable — Rusted iron nails, broken ceramics

H. Give reasons for the following.

1. Landfills should be away from human habitation.

Ans. Waste in landfills generates foul smell, attracts rodents, birds, etc. They become breeding grounds of mosquitoes and flies. Waste may pollute soil and groundwater. Moreover, landfills spoil aesthetic look of the area around.

2. Rural waste can be managed easily.

Ans. Rural waste mainly contains farm waste such as fallen leaves, twigs, waste of animals, dead parts of plants and animals, etc. Such waste is biodegradable and thus, can be managed easily by converting it into manure.

3. We should avoid using plastic bags.

Ans. Plastic bags accumulated in garbage are responsible for death of stray animals. Cattle eat leftover food, etc. from garbage and consume plastic bags along with their food. This chokes their stomach and causes death. Besides this, plastic bags also choke the drains causing them to overflow.

4. We should use articles again and again.

Ans. Reusing articles helps in generating less waste. This saves our environment.

5. The wastes should be segregated.

Ans. Segregation of waste into compostable and recyclable waste helps to manage the waste properly. Segregating waste at the waste generating sites saves energy, time and less waste is sent to landfills.

6. Open dumping of solid waste is very harmful.

Ans. Open dumping of solid waste which remains uncovered is very harmful because it spreads germs, attracts flies, rats and worms. It becomes breeding ground of mosquitoes and many disease-causing germs. It produces foul smell and also spoils the aesthetic view of the area around.

I. Skill-based questions.

1. Ratan's father is a gardener. He avoids to burn the dried leaves of plants. Why?

Ans. Leaves can be used to prepare compost to be used as manure for plants. Burning leaves produces smoke which pollutes our environment.

2. Rehana has just visited Rock Garden in Chandigarh. What message did she get from there?

Ans. Nonbiodegradable material can be utilised to make decorative or utility items (Reuse).

3. Nonbiodegradable waste is more hazardous for mankind. Why?

Ans. Nonbiodegradable waste is not decomposed by microbes. It accumulates and pollutes surroundings. Some metals and chemicals are harmful and cause health hazards.

4. The depletion of ozone layer in the atmosphere is dangerous. Why?

Ans. Depletion of ozone layer in the atmosphere is dangerous because in its absence harmful solar radiations and UV rays will directly reach the earth and cause cancer and various other diseases to humans and animals.

J. Activity/Project-Do as directed.

Taposhi studied about the three Rs (Reduce, Recycle and Reuse) in his school. She kept a watch on the dustbins of her house for a week. Help her record at least five things that she can reduce, reuse and recycle.

Ans. Do it yourself.

Think Zone

1. Government has taken up some projects to clean major rivers in India. Name at least three such projects.

Ans. Ganga Action Plan, Yamuna Action Plan and Narmada Action Plan.

2. Some wastes take many years to get decomposed. Can you name some of them?

Ans. Nonbiodegradable wastes include detergents, polythene bags and metallic compounds.