ONLY FOR TEACHERS

CONTENTS

WONDERS OF SCIENCE 6

Components of Food

A. Tick (✓) the correct option.

1. (a) 2. (d) 3. (c) 4. (a) 5. (c)

B. Fill in the blanks with correct words.

1. Fat 2. Protein 3. A
4. K 5. Kwashiorkor

C. Match the Following.

1. c 2. e 3. a 4. b 5. d

D. Give examples of each of the following.

1. Carrots, Tomatoes
2. Peas, potatoes
3. Vitamins: (i) Sunlight (ii) Milk.
   Minerals : (i) Bread (ii) Eggs.
4. Iodine.
5. Pulses, Green leaf vegetable.

E. Short Answer Type Questions.

1. (a) Carbohydrates, Fats, Proteins, vitamins, Minerals and Roughage.
   (b) Carbohydrates and fats.
   (c) Vitamins, Minerals, Carbohydrates, Proteins, Fats, and water.
   (d) Vitamins and Minerals
   (e) Calcium. (f) Vitamin 'A' (g) Raughage.
2. Protein are required by our body for muscles building and reaping worn out tissues.

3. (a) Carrots, Tomatoes. (b) Peas, Potatoes. (c) Lemon, Orange.
   (d) Sunlight, Milk. (e) Milk, Cheese. (f) Meat, Pulses.
   (g) Seafood, Iodised Salt .
4. Minerals help our body to remain healthy.
5. A Diet containing all the nutrients in adequate quantities is known as balanced diet.
6. Diseases which occur due to the deficiency of one or mor essential nutrients in the diet are called deficiency diseases. Deficiency diseases cannot be transmitted from one person to another. So they are considered as non-comanunicable diseases.

F. Long Answer Type Questions.

1. (a) **Carbohydrates :** They are energy-giving compounds needed by our body to carry out day-to-day activities.
   (b) **Fats :** They are also energy-giving compounds. They give more energy than carbohydrates.
   (c) **Proteins:** They are body building components that protect the body from various infections.
   (d) **Vitamins :** They are protective foods that prevent diseases and help in keeping our bones, teeth, gums and eyes healthy.
2.

Vitamins & Minrals	Symptoms	Vitamins & Minrals
Vitamin A	Loss of vision in the dark.	Night Blindness
Vitamin B	• Very little energy to work. • Weak muscles.	Beriberi
Vitamin C	• Swelling and bleeding of gums. • Weak muscles.	Scurvy
Vitamin D	Week bones. Decaying teeth, bow legs and development of pigeon chest conditions.	Rickets
Calcium	Brittle bones, Tooth decay, Excessive bleeding.	Bones and tooth decay
Iron	Pale body colour, whitish mails, Body weakness.	Amaemia
Iodine	Mental retardation in children, Enlargement of thyroid gland (in the neck)	Amaemia

3. A balanced diet is not the same for everyone. It varies with age, sex and the type of wok that one does (Occupation).

(i) Children need to eat more protein- rich food as the growth during early childhood is rapid.

(ii) Labourers doing hard work need more of carbohydrates and fats as they need more energy.

(iii) Pregnant women also need more protein. Extra protein is required by the baby growing inside the womb.

4. Deficiency of water or dehydration is caused due to excessive loss or less intake of water. To prevent dehydration, drink plenty of fluids and eat food high in water such as fruits and vegetables.

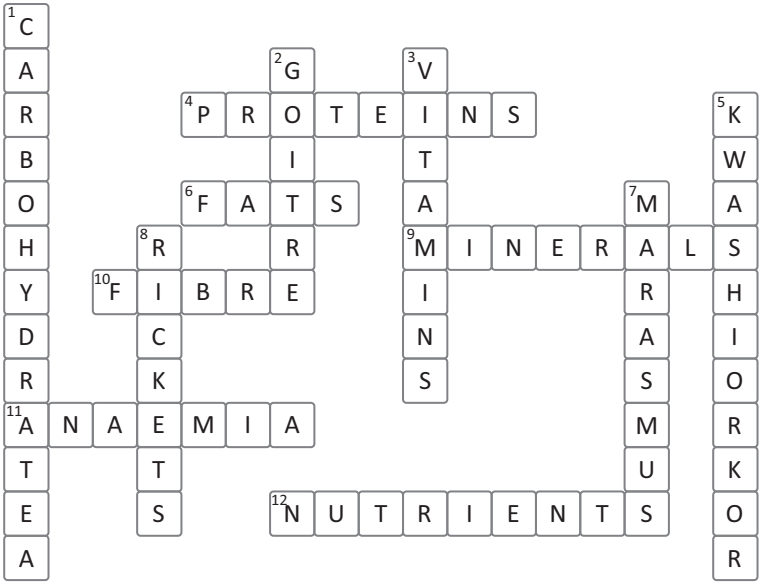
5. Diseases which occur due to the deficiency of one or mor essential nutrients in the diet are called deficiency diseases. Deficiency diseases cannot be transmitted from one person to another. So they are considered as non-comanunicable diseases.

Learn by Doing

A. ACTIVITY

Nutrient	Source of Nutrient	Deficiency Disease
1. Vitamin C	**Citrus fruits, tomatoes**	Scurvy
2. Iron	**Cereals, Pulses, Meat**	**Amaemia**
3. **Iodine**	**Seafood and Iodised salt**	Goitre
4. Vitamin D	**Sunlight, Milk**	**Rickets**

C. PUZZLE



Separation Of Substances

A. Tick (3) the correct option.

1. (d) 2. (b) 3. (c) 4. (b) 5. (a) 6. (a)

B. Fill in the blanks with correct words.

1. Winnowing 2. Sieving 3. Decantation
4. Solvent 5. increasing

C. Match the Following.

1. d 2. a 3. e 4. c 5. b

D. Name the methods of separation used to separate these mixtures.

1. Decantation 2. Hard-Piching 3. Evaporation
4. Filtration and Evaporation 5. Threshing

E. Short Answer Type Questions.

1. By filtration method, tea leaves are separated from tea.
2. Farmers cut stalks and make their bundles. Bundles are allowed to dry for a few days. When the stalks are dried, grains are separated from them either manually or with the help of a machine called thresher.
3. The process by which two substances are separated by passing the mixture through a filtering device is called filtration.
4. Condensation is the process by which water vapor in air is changed into liquid water.
5. Salt is obtained by evaporating seawater trapped in salt pans. heat of the sun gradually evaporates the water in the pans and the salt in then piled to dry.
6. Solubility depends on many factors like :
   (a) Nature of solute (b) Nature of solvent (c) temperature.
7. Sugar can be separated from wheat flour by sieving. Due to the difference in the size of particles, sugar will stay on a sieve and fine particles of wheat flour will pass through it.

F. Long Answer Type Questions.

1. **Aim :** To separate components of a mixture by sieving.

   Materials required : Flour, powdered chalk, old newspaper and a sieve.

   Procedure :

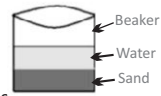
   1. Sieve the flour on the newspaper to separate husk or any impurities.

2. Take a small amount of flour and mix it with fine chalk powder.
3. Sieve the mixture.

Observation : Husk and other impurities could be separated from the flour, but chalk powder could not be separated.

Conclusion : Husk particles are bigger than flour particles, so they are retained in the sieve. Particles of chalk powder and flour do not differ much in size, so chalk powder could not be retained in the sieve. Thus sieving can be used to separate particles of different sizes.

2. **Sedimentation :** Sedimentation is a method of separating insoluble solids from a liquid by allowing the solids to settle down. The insoluble substances which settle down are called sediments.



Sedimentation

For example, in the process of cleaning rice grains and pulses, they are kept in a bowl of water. Being heavier than water, the pulses or grains settle down whereas dirt, insects and other undesirable things being lighter, float on top. This water is then thrown away to get the clean rice or pulses.

Decantation : The process of transferring the liquid (after sedimentation) without disturbing the sediment is called decantation. The liquid above the sediments is called supernatant.


Decantation

A mixture of sand and water is separated by the process of sedimentation and decantation. On allowing a mixture of sand and water to stand still for sometime we find that sand being heavier, settles down at the bottom of the beaker. The settled sand is termed as the sediment. The clear water which gets collected on the top of the sediment can now be poured out and collected in other container by the process of decantation.

3. The process in which a liquid changes into its vapour is called evaporation. This method is used to separate solids dissolved in a liquid.

   When a solution is heated gently, the solvent evaporates from the surface of the liquid and the solid will be left behind.

4. It is easier to dissolve sugar in hot milk than in cold milk because solubility of sugar increases with temperature.

5. (i) **Evaporation :** The process in which a liquid changes into its vapour is called evaporation. This method is used to separate solids dissolved in a liquid.

   Condensation : The process in which water vapour in air is changed into liquid water, is called condensation.

   (ii) **Distillation :** It is the process in which evaporation is followed by

condensation.

Decantation : The process of transferring the liquid (after sedimentation) without disturbing the sediment is called decantation.

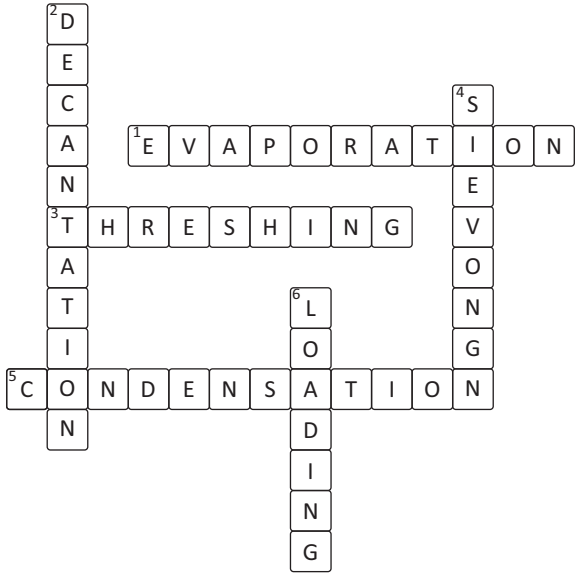
(iii) **Filtration :** The process by which tow substances (an insoluble solid and a liquid) are repartee bypassing the mixture through a filtering device is called filtration.

Sieving : The process by which the components of a mixture are separated by using sieve is called sieving.

6. Clear water can be obtained from a sample of muddy water by the method of filtration. In this method, the sample of muddy water is poured through a filter paper. Water will pass through the filtering medium, leaving behind the mud.

Learn by Doing

C. PUZZLE



Different Kinds of Materials

EXERCISES

A. Tick (3) the correct option.

1. (a) 2. (a) 3. (c) 4. (d) 5. (b) 6. (d)

B. Fill in the blanks with correct words.

1. grouping
2. luster
3. Solubility
4. opaque
5. more
6. conductor

C. Match the Following.

1. b
2. c
3. a
4. f
5. d
6. e

D. Short Answer Type Questions.

1. The diferent properties of materials are solubility, magnetic property, elasticity, strength and hardness, thermal and electrical conductivity, transparency and diffusion.
2. Steel spoon and gold jewellery.
3. Depending on transparency, materials can be of three types:
   (i) Materials that allow all the light to pass through them are called transparent materials.
   (ii) Materials that allow some light to pass through them are called translucent materials.
   (iii) Material that do not allow light to pass through them are called opaque materials.
4. Sugar and salt gets completely dissolved in water.
5. Density of a material decides whether it will sink or float on a liquid.
6.

Conductors	Insulators
Materials that allow heat or electricity to flow through them are called conductors.	Those materials which do not alwo heat or electricity to flow throught them are called insulators.

E. Long Answer Type Questions.

1. Materials that allow some light to pass through them are called translucent materials. It is very difficult to know about each and every thing. However, there are certain similarities and differences between different things which help us to group similar things and distinguish them from other things. Grouping makes it easier for us to find things when we need them.
2. **On the basis of appearance :** All the materials can be classified into towo grousp:
   (i) Materials having lustre or shiny appearance, e.g., gold jewellery, stell spoon, etc,
   (ii) Materials having no lustre or dull appearance, e.g., a plastic toy, woollen clothes, etc.

   On the basis of roughness : Materials can be rough or smooth, Rough materials have bumps or ridges on their surface, which can be felt by

touching them. Smooth materials lacks these bumps.

Examples of rough surface : Rocks, sandpaper, bark of a tree, etc.

Examples of smooth surface : A glass sheet, a flower petal, surface of aplle, etc.

On the basis of transparency : Depending on transparency, materials can be of three types:

(i) Materials that allow all the light to pass through them are called transparent materials.

(ii) Materials that allow some light to pass through them are called translucent materials.

(iii) Material that do not allow light to pass through them are called opaque materials.

3. On the basis of state of a material, they are grouped as follows:

Solids : They have a fixed shape and volume. Solids cannot be compressed as the particles are packed together closely.

Liquids : They do not have a fixed shape and take the shape of the container they are stored in. But they have definite volume. Liquids can be compressed to a small extent as particles are less tightly packed.

Gases : They have neither fixed shape nor a fixed volume. Gases are highly compressible as the particles are loosely packed.

4. Materials like salt and sand sink in water, while coconut oil and talcum powder float on the surface of water. This happens due to the differences in their density. Substances heavier than water sink in it, while substances lighter than water float on it. So, density of a material determines whether it will float or sink in water. Less dense materials like oil, feather, etc., float on water and more dense materials like stones, iron, etc., sink in water.

5.

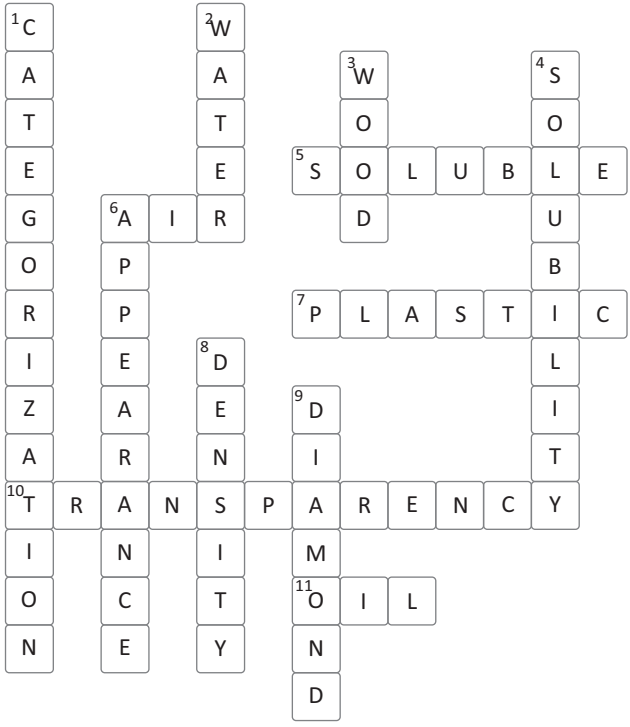
S. No.	Material which added to water	Behaviour of Material on the basis of	
		Aquatic Plants	Aquatic Plants
(a)	Sugar	Sink	Soluble
(b)	Salt	Sink	Soluble
(c)	Milk	Sink	Soluble
(b)	Sand	Sink	Insoluble
(b)	Honey	Sink	Soluble
(b)	Cooking Oil	Float	Insoluble
(b)	Lime Juice	Sink	Insoluble

Learn by Doing

B. PROJECTS WORK

Object	Floats	Sinks
Leaf	Yes	No
Wooden cork	Yes	No
Pebble	No	Yes
COin	No	Yes
Pencil	Yes	No
Button	No	Yes
Straw	Yes	No
Feather	Yes	No
Iron Nail	No	Yes

C. PUZZLE



Things Around Us

A. Tick (3) the correct option.

1. (a) 2. (b) 3. (c) 4. (c) 5. (c) 6. (d)

B. Fill in the blanks with correct words.

1. Photosynthesis 2. Oxygen, Carbon dioxide 3. Stomata
4. eggs 5. excretion 6. multicallular

C. Match the Following.

1. c 2. b 3. a 4. e 5. d

D. Name the methods of separation used to separate these mixtures.

1. Decantation 2. Hard-Piching 3. Evaporation
4. Filtration and Evaporation 5. Threshing

E. Short Answer Type Questions.

1. Those features which are common between living and non-living things are :
   (i) All things, whether living or non-living, posess mass, shape and occupy space.
   (ii) They are made up of basic structural units. In case of living things, cell is the structural unit. In a non-living thing, the molecule is the structural unit.
2. Leather, wool, wood, cooking oil, rubber.
3. Robots and vehicles.
4. (a) Gum and Later.
   (b) Urine, feces, sweat, carbon dioxide.
   (c) Carbon dioxide, water and energy.
   (d) Amoeba
   (e) cell
5. Animals and plants reproduce in different ways :
   (i) Some animal produce their young over through eggs as you find in birds.
   (ii) Some animal give birth to young ones, as seen in cow, cats and humans.
   (iii) Some plants reproduce through seeds, e.g., pea, gram, mango.
   (iv) Some Plants reproduce through cutting e.g., henna and rose.

(v) Some plants reproduce through stem pieces containing a bud, e.g., potato.

6. **Dead things :** Fallen leaf, bone, fossil.

Non-living things : Wrist watch, water, wooden shelf, brick, glass, steel, mobile phone.

F. Long Answer Type Questions.

1. The process of removal of waste products from organisms is called excretion. The animal waste are excreted in the form of urine, faeces, sweat and carbon dioxide. Carbon dioxide gas is the by-product released in the process o g respiration. In plants, carbon dioxide and water vapour are excreted through small pores called stomata present in the leaves. In some plants, waste products take the form of secretions. The secretion may be in the form of a sticky substance called gum or thick fluid called latex this fluid can be seen if you break the twig of a rubber plant or a madar plant.

2. Characteristics common to the living things : -

Nutrition : All living things need food. Food gives energy to the organisms, so that the processes of life can go on inside them.

Respiration : This is a chemical reaction in which food reacts with oxygen to release energy. Carbon dioxide and water are also produced.

Food + Oxygen Õ **Carbon Dioxide + Water + Energy**

Excretion : The body has a way of getting rid of its harmful waster. The a way of getting rid of its harmful wastes. The process of getting rid of waster by the living organisms. is called excretion.

Reproduction : All living things have the ability to produce more of their own kind.

Movement : Animal move from one place to another place and also show other body movements. Most plants do not move. But they show movements of certain parts, such as leaves, stems, roots and flowers.

Response to Stimuli : Changes in the surroundings of an organism which makes it respond to the changed are called stimuli. The organism's reaction to the stimulus is called a response.

Cellular Organization: All diving things are made of cells.

3.

S. No.	Characterstic	Living Things	Non-living Things
1	Nutrition	Required food	Do not require food
2	Respiration	Show respiration	No respiration
3	Growth	Growth is present; it is internal and irreversible	No growth; even if present, it is external and reversible

4	Excretion	Excrete waste products	Waste products not formed
5	Reproduction	Reproduce	No reproduction
6	Movement	Show movements on their own	No movement on their own
7	Response to stimuli	Present	Absent
8	Cellular organization	Are made up of cells	No cells are found

4 (a)

Living Things	Non-living Things
(i) Required food.	(i) Do not require food.
(ii) Show respiration.	(ii) No respiration.
(iii) Growth is present.	(iii) No growth.
(iv) Excrete waste products.	(iv) Waste products not formed.
(v) Reproduce	(v) No reproduction.
(vi) Show movements	(vi) No move wentx.
(vii) Present	(vii) Absent
(viii) Are made up of cells.	(viii) No cells are found.

(b) **Unicellular organism:** Those living things consisting of a single cell. The single cell living things are amoeba, yeast, bacteria ete.

Multicellular organism : Most organisms are made of millions of cell. These are multicellular organisms. For example, human being, housefly, dog, horse, roxe, mango, etc

(c) **Respiration :** This is a process in which energy is released from food. The released energy is used for caring out life processes such as growth and movement.

Breathing : This is the process of air moving in and out the body. It involves exchange of gases (oxygen and Carbon dioxide).

(d)

S. No.	Characterstic	Plants	Animals
1	Nutrition	Can prepare their own food (autotrophic in nutrition)	Cannot make their own food; obtain food from plants or other animals (heterotrophic in nutrition)

2	Respiration	Fixed to the soil; do not show free movements	Show locomotion from one place to another
3	Growth	Localized to certain regions	Diffused in all parts of the body

5. A cell is the smallest unit of living things. Some diving things are made of up of only a single cell, like amoeba, yeast. Living things consisting of a single cell are called unicellular organisms.

   Most organisms are made up of millions of cell. There are called multicellular organisms. For example human being, dog, horse, rose, mango, etc.

The Living Habitat

A. Tick (3) the correct option.

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

B. Fill in the blanks with correct words.

1. spines, transpiration 2. xerophytes 3. frog
4. Grassland 5. narrow, ribbon-like
6. yak, polar bear 7. Arboreal

C. Match the Following.

1. d 2. c 3. a 4. b 5. e

D. Short Answer Type Questions.

(i) **Camel :** A camel has long legs which help to keep the upper part of its body away from the heat of sand on the ground.

(ii) **Yak :** A yak has a thick coat of fur which protects it from cold.

(iii) **Cactus :** Its roots are long and reach the deep layers of the soil to absorb water.

(iv) **Deer :** Its eyes are located on the side of the head, so that it can look In all directions. This helps it to escape danger.

(v) **Snow leopard :** A snow leopard also has a thick layer of fur on its body including feet and toes to protect it from the cold.

(vi) **Polar bear :** A polar bear has a thick layer of fur on the body and a layer of fat underneath its skin which protects the animal from cold.

(vii) **Fish :** The body shape of a fish is streamlined and it has fins. These features help it in swimming.

(viii) **Lion :** The light brown colour helps it to hide in dry grasslands which are also brownish in colour.

(ix) **Water lily :** Leaves are large and circular A waxy coating is also present on the leaves that prevents them from decay.

(x) **Dolphin :** They breathe in air through their nostrils.

(xi) **Pine tree :** It has cone-shaped with slopping branches which makes the snow fall off easily.

(xii) **Frog :** It's strong hind legs help it in leaping and catching the prey.

(xiii) **Hy drilla :** Stem is long, hollow and thin it can bend along with the water movement.

2. Decomposers are microorganisms such as bacteria and fungi. They decompose the dead remains into nutrients in the soil which are used by plants for growth.

3. In deserts, there is a scarcity of water and have hot and dry climate. They have a short rainy season followed by a long dry season. Living organisms have adapted to live in these environmental conditions. Two commonly found organisms in this habitat are camel and cactus.

   The weather is cold and windy in mountain. Also, the ground is mostly covered with snow. These conditions make it difficult for plants to grow and for animals to move around and find food there. Thus, they have certain adaptation to live in mountains.

4. An animal that hunts other animals for its food is called a predator. The animal that gets hunted by the predator is called prey. A lion is a predator, while deer is its prey. A predator is usually bigger in size than the prey.

5. Stem is long, hollow and thin, so that it can bend along with the water movement.

   Roots are very much reduced, as water is available in plenty. The main function of roots is to hold the plant in place.

6. Leaves vary in size and shape in submerged and floating plants. In submerged plants, leaves are narrow, thin and ribbon-like. They can bend and move easily in the flowing water without being torn apart. In floating plants like water lily, leaves are large and circular. A waxy coating is also present on the leaves that prevents them from decay.

7. Sea anemones have a sucker-like base which helps them to grip the sides of a rocky pool. This adaptation protects them from being swept away by water currents.

E. Long Answer Type Question.

1. **(i) Abiotic Components :** Abiotic components in clude non-living things scuh as soil, water. air, water. air, sunlight and temperature. Since, abiotic component is a non-living part of an ecosystem.

(ii) **Habitat :** The natural surroundings where an organism lives is called its habitat or its home. It provides food, shelter, water and suitable climatic conditions to an organism. Examples of habitats include pond, river, forest, desert and tree.

Animals and plants that live together in a habitat form a community. For example, fish, lotus and water hyacinth live in a pond or a river forming a community. Similarly, squirrels, monkeys and birds live on trees.

(iii) **Adaptation :** An adaptation may be defined as a modification or change in an organism's body or behaviour that helps it to survive in a particular habitat or environment. Different living organisms are adapted to their habitats/surroundings in different ways. Adaptation may be in the form of shape, size, colour, structure or behaviour. For example, the forelimbs of birds are modified into wings so that they can fly.

2. Biotic components include all living things of an environment such as plants, animals and decomposers. Each of these play an important role in the sustenance of the environment.

Plants : Green plants prepare their own food using water and carbon dioxide in the presence of sunlight. So, they are called producers or autotrophs. This process takes place in green leaves and green stems these have a pigment called chlorophyll which traps sunlight.

Animals : Animals cannot make their own food and depend on plants. They are called consumers or heterotrophs. On the basis of their feeding habits, animals can be categorized into herbivores, carnivores and omnivores. Herbivores eat plants and plant parts. Carnivores eat the flesh of animals. Omnivores eat both plants and animals.

Certain animals feed on the dead bodies of animals and are called scavengers. They help to clean the environment.

Decomposers : Decomposers are microorganisms such as bacteria and fungi. They decompose the dead remains into nutrients in the soil which are used by plants for growth.

3. Abiotic components affect the biotic components of environment as they are needed for the survival of latter. For example, soil and water are needed by the plants to grow, and sunlight, air and water are needed by them to prepare food. Animals require air, water, food, light and shelter to live. An environmental area that fulfils all these requirements for survival of the animals is known as their habitat.

4. Habitats are of the following types:

Terrestrial habitats: Such habitats include habitats on land like forests, grasslands, deserts and mountains. Organisms that live on land like tiger, cow, dog, horse, camel, elephant and polar bear are terrestrial organisms.

Aquatic habitats: These habitats include freshwater habitats like ponds, lakes, streams and rivers, and saline water habitats like seas and oceans. Organisms that live in water like fish, turtle, lotus, water lily, duckweed, water chestnut and water hyacinth are aquatic organisms.

Arboreal habitats: These habitats include habitat on trees. Arbor is a Latin word which means trees or its branches. Tree-dwelling organisms like monkey and squirrel are arboreal organisms.

5. (i)

S.No.	Terrestrial Plants	Aquatic Plants
1.	They are the living components of a habitat.	The are the non-living components of any habitat.
2.	They include plants, animals, etc.	They include light, water air, temperature etc.

(ii) **Terrestrial habitats:** Such habitats include habitats on land like forests, grasslands, deserts and mountains. Organisms that live on land like tiger, cow, dog, horse, camel, elephant and polar bear are terrestrial organisms.

Aquatic habitats: These habitats include freshwater habitats like ponds, lakes, streams and rivers, and saline water habitats like seas and oceans. Organisms that live in water like fish, turtle, lotus, water lily, duckweed, water chestnut and water hyacinth are aquatic organisms.

6. (i) Yak, snow, leopard, polar bear (found in the Arctic areas) and penguin are some examples of animals living in mountains.

A yak has a thick coat of fur which protects it from cold. When the ground is covered with snow, yak uses its hooves and horns to break the ice and graze on the grass beneath.

A polar bear has a thick layer of fur on the body and a layer of fat underneath its skin which protects the animal from cold. Padded feet help it to walk on snow.

A snow leopard also has a thick layer of fur on its body including feet and toes to protect it from the cold.

(ii) **Adaptations in Animals :**

Fish

(a) The body shape of a fish is streamlined and it has fins. These features help it in swimming.

(b) It has gills instead of lungs which help it to breathe underwater.

(c) Tail helps in movement and changing direction in water.

Frog : Animals that live both on land and in water are called amphibians.

A frog is an amphibian and has the following features :

(a) Its strong hind legs help it in leaping and catching the prey.

(b) It has webbed feet to help in swimming.

(c) It has lungs for respiration on land and moist skin for respiration in water.

Adaptations in Plants : The following adaptations are found in the roots, stems and leaves of water plants :

(a) Stem is long, hollow and thin, so that it can bend along with the water movement.

(b) Roots are very much reduced, as water is available in plenty. The main function of roots is to hold the plant in place.

(c) Leaves vary in size and shape in submerged and floating plants. In submerged plants, leaves are narrow, thin and ribbon-like. They can bend and move easily in the flowing water without being torn apart. In floating plants like water lily, leaves are large and circular. A waxy coating is also present on the leaves that prevents them from decay.

7. It can live for many days without water. To retain water in its body, a camel excretes a small amount of urine, its dung is dry and it does not sweat. A camel has long legs which help to keep the upper part of its body away from the heat of sand on the ground. Its feet have thick pads which protect it from the hot desert sand. It stores fat in its hump which acts as a food reserve.

Plants : Form and Function

A. Tick (3) the correct option.

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

B. Fill in the blanks with correct words.

1. Roots 2. Roots 3. Lamina 4. Stem 5. midrib
6. Transpiration 7. Flower 8. anther, stigma

C. Match the Following.

1. d 2. c 3. f 4. a 5. b 6. e 7. g

D. Write one word for the following.

1. Fibrous roots 2. Lamina 3. Stamen 4. Pollen Grains

5. Node 6. Sepal 7. petal 8. ovary
9. Stomata 10. Pistil 11. Transpiration 12. Pollination

E. Short Answer Type Questions.

1. Different Parts of plants are:
   (i) Root (ii) Stem (iii) Fruit (iv) Flower (v) feaf
2. (i) Mango, Neem (ii) Grass, Wheat
   (iii) Leaves of mango, Peepal (v) Leaves of banana, paddy.
3. **Roots :** (i) Roots help to anchor the plant firmly into the ground.
   (ii) They help plants to absorb water and nutrient from the soil, which are essential for their survival.
   Stem : (i) Stem helps to keep the plant upright.
   (ii) It holds leaves in position and helps them to spread out as the stem and its branches grow.
   Leaf : (i) Leaves make their food for the plants by a process called photosynthesis.
   (ii) Tiny pores called stomata are present on the deaf surface. There is an exchange of gases (carbon dioxide and oxygen).
   Flower : (1) Flower in the reproductive organ of a plant, It leads to the formation of fruit and seeds. New plants arise after the germination of seeds.
   (ii) The nectar of the flower is used as food by insects.
4. **Herbs :** Small plants with soft green stems are called herbs. They do not have any branches. They do not grow more than 3-4 feet in height. Example : wheat, grass etc.
   Shrubs : Medium-sized plants with hard thin, woody stems are Called shrubs. They have multiple stem and are shorter with height of usually 1-3 metres. Example : China rose, lemon, heena.
   Creeper : Creepers are plants having weak stems that spread/creep on the ground. Example: pumpkin and Watermelon.
   Climbers : Climbers have weak stem so in order to reach sunlight, they climb up some support. Example:- money plant and peaplant.
   Reticulate venation : In reticulate venation, veins from a net like pattern on both sides of the midribs. Example: Leaves of mango, peepal, neem etc.
   Parallel venation: In parallel venation, veins are arranged in parallel lines on both sides of the midrib. Example leaves of banana, grass, paddy etc.
   Stamens : Stamens are long thin stalks with rounded swollen tips around the centre of the flower. Stamens are the male reproductive part of plants.

Pistil : The inner most part of a flower is called the pistil. It is a single elongated flask shaped Structure pressent in the centre of flower. Pistil is the female part of the flower.

5. **Reticulate venation :** Gram, Pea, Rose, Mango, Guava, Petunia,

   Parallel Venation : Grass, banana , date palm.

F. Long Answer Type Questions.

1. Plants can be classified depending upon their heights and type of stems as follows :

   TYPES OF PLANTS

   Herbs : Small plants with soft green stems are called herbs. They do not have any branches. Herbs do not grow more than 3-4 feet in height. Examples : Wheat, paddy, grass, coriander, mustard, petunia and balsam.

   Shrubs : Medium-sized plants with hard, thin, woody stems are called shrubs. They have multiple stems and are shorter with height of usually 1-3 metres.

   Examples : Hibiscus, Lantana, china rose, lemon, pomegranate.

   Trees : Tall plants with hard and woody stems are called trees. Branches are present in the upper part of the stem.

   Examples : Neem, peepal, mango, jamun and amaltas.

   There are two other categories of plants which need support to grow as they have weak stems and cannot stand straight on their own. These categories are given on next page.

   Climbers : Climbers have weak stem so in order to reach sunlight, they climb up some support. Example : Money plant and peaplant.

   Creepers : Creepers are plants having weak stems that spread/creep on the ground. Examples: pumpkin and watermelon.

   - Roots help to anchor the plant firmly into the ground.
   - They help plants to absorb water and nutrients from the soil, which are essential for their survival.

2. - Roots help to anchor the plant firmly into the ground.
   - They help plants to absorb water and nutrients from the soil, which are essential for their survival.
   - They help to bind the soil particles together, thereby preventing them from being carried away by water or wind.
   - In plants such as carrots, potato, radish and beetroot, the roots are swollen. These roots store food produced by the plants which the plants use when needed.
   - In plants like the banyan and bamboo, long rope like roots grow downwards from the main branches and go inside the ground to

provide additional support to heavy branches. They also help in transportation of additional nutrients and water to the stem. These roots are called prop roots.

3. **Roots :** (i) Roots help to anchor the plant firmly into the ground.

   (ii) They help plants to absorb water and nutrient from the soil, which are essential for their survival.

   Stem : (i) Stem helps to keep the plant upright.

   (ii) It holds leaves in position and helps them to spread out as the stem and its branches grow.

   Leaf : (i) Leaves make their food for the plants by a process called photosynthesis.

   (ii) Tiny pores called stomata are present on the deaf surface. There is an exchange of gases (carbon dioxide and oxygen).

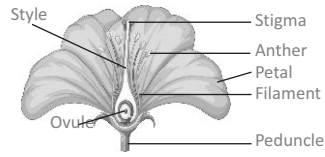
   Flower : (1) Flower in the reproductive organ of a plant, It leads to the formation of fruit and seeds. New plants arise after the germination of seeds.

   (ii) The nectar of the flower is used as food by insects.

4. Structure of Flower

   The basic parts of a flower are :

   Sepals : The outermost green leafy structures at the base of the flower are called sepals. The sepals protect the flower in the bud.



Structure of flower

   Petals : The coloured parts that surround the inner part of the flower are called petals. In most flowers petals impart fragrance and attract insects which help in the process of reproduction.

   Stamens : Stamens are long thin stalks with rounded swollen tips around the centre of the flower. Stamens are the male reproductive part of plants.

   Each stamen consists of two parts – Filament and anther.

   (a) Filament : These are green stalks present at each stamen.

   (b) Anther : A knob like structure present at the tip of filament is called anther.

   If the anther is split open fine yellow particles are exposed out. These fine yellow particles are called pollen grains which take part in reproduction.

   Pistil or Carpel : The inner most part of a flower is called the pistil or carpel. It is a single elongated flask shaped structure present in the centre of the flower. Pistil is the female part of the flower. It is broader at the base and tapers at the top. The lower broader portion of the pistil is

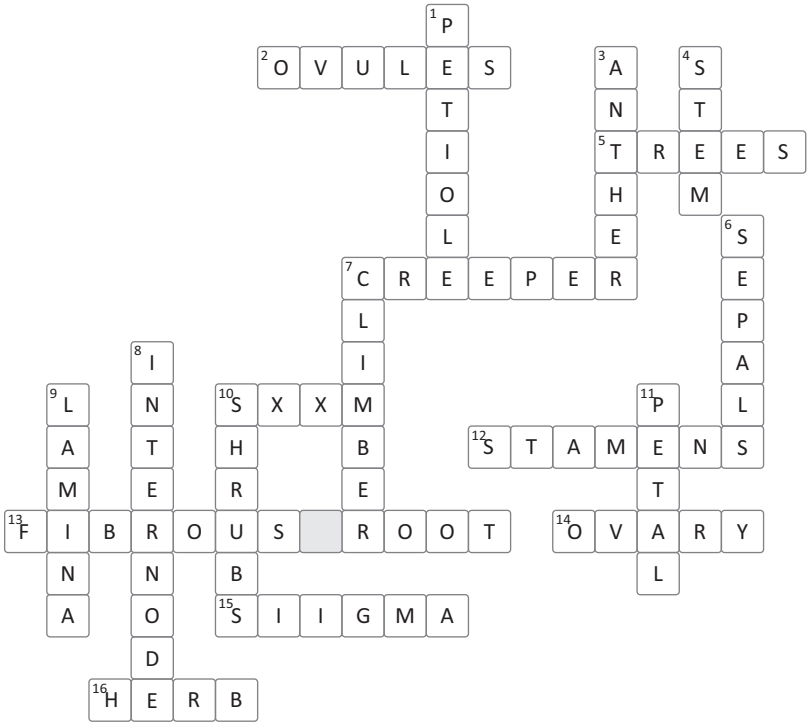
called ovary. The narrow elongated upper portion of the pistil is called the style. The top of the style is sticky and this sticky end is called stigma.

If the ovary is spilt lengthwise, some bead like structures are visible inside. These bead like structures are called the ovules. The ovules are attached along the walls of the ovary.

5. The Process of transfer of pollen grain from anther to stigma is called pollination. After pollination, the ovary change into a fruit and ovules change into seeds. Seed are sown in the ground. On getting favorable conditions for growth, seed develop into seedlings (baby plants).

Learn by Doing

C. PUZZLE



Movement In Animals

A. Tick (3) the correct option.

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

B. Fill in the blanks with correct words.

1. Locomotion 2. three, two 3. shell 4. earth worm
5. snail 6. head 7. hinge 8. hinge
9. tendons 10. contracting, relaxing

C. Match the Following.

1. c 2. d 3. a 4. b 5. g 6. e 7. f

D. Write one word for the following.

1. Earthworm 2. Streamlined 3. Tendons 4. Hinge Joint
5. Immovable joints 6. Backbone 7. Foot
8. Exoskeleton 9. Heart 10. Joint 11. Lower Jaw

E. Short Answer Type Questions.

1. (i) **Cockroach :** Cockroaches have two types of muscles :
   (a) Muscles present near the legs help in walking.
   (b) Breast muscles attached to the wings help in flying.
   Cockroaches have three pairs of jointed legs which help them in walking and two pairs of wings which help them to fly.

   (ii) **Earthworm :** An earthworm's body is made up of several parts called segments. It moves by lengthening and shortening these segments. It extends the front part of the body, keeping the rear end fixed to the ground. Then it fixed the front part and pulls the rear end. Its movement can be compared with that of a spring. Its body secrets a slimy substance to help in the movement on the soil.

   (iii) **Snail :** A snail creeps along on a strong muscular organ called a foot. The muscles of its foot move in backward, wave-like motion that propels the snail forward. The moving snail pours out a sticky slime, called mucus which helps the snail move by reducing the friction between body and ground.

   (iv) **Fish :** The body of a fish is streamlined which offers minimum resistance to the forward movement while swimming. The skeleton of the fish is made up of strong muscles. While swimming, the

muscles make the front part of the body curve to one side and the tail moves towards the opposite side. The fish forms a curve due to this movement. Then the body and tail quickly curve to the other side. This produces a thrust that helps the fish to move forward.

(v) **Bird :** Birds have hollow and light bones which makes their body light. Bones of the forelimbs are modified into wings. The bones of the hind limbs are mostly used for walking and perching. The strong breast muscles which are attached to the forelimb bones help in pushing or pulling the wings as well as flapping of the wings and hence help in flying.

(vi) **Snake :** The snake's body curves into many loops. Each loop gives the snake a forward push by pressing against the ground. The thrust given by all the loops together allows the snake to move forward very fast in a wave-like manner.

2. (i) Fish have fins on their body which help to keep the balances of the body and to keep direction while swimming.

   (ii) Scales and muscles in a snake : Snakes have special elongated scales on their belly to help them crawl and climb. A snake has many thin muscles which are loosely packed but are connected to each other. These muscles are also connected to the backbone, ribs and skin. Snakes use these muscles to move about.

3. The shape of the body of a fish is streamlined which offers minimum resistance to the forward movement while swimming.

4. Birds have hollow and light bones which makes their body light. The strong breast muscles which are attached to the forelimb bones help in pushing or pulling the wings as well as flapping of the wings and hence help in flying.

5. A ribcage is a bony structure which is attached to the vertebral column and sternum in humans. The rib cage provides protection to heart and lungs. Human beings have 12 pairs of ribs. You can feel your ribs by running your fingers across your chest.

6. Joints are places where two or more bones meet. The bones are held together at the joints by strong structures called ligaments.

7. Muscles that are attached to the bones are called skeletal muscles. These muscles allow the movement of bones. These are connected to bones by a strong fibrous tissue called tendon. Skeletal muscles work in pairs by contracting and relaxing. These properties are responsible for their movement. When one muscle contracts, it pulls the bone and moves it, meanwhile the other muscle relaxes. To move back the bone, the other muscle contracts while the former relaxes.

8. Skeletal muscles are responsible for movement of bones.

9. (i) **Ball and socket Joint :** In this type of joint, the ball-like surface of one bone fits into a cup-like hollow in the other. A ball and socket joint allows maximum movement in all directions.

   Examples : Joints at the hip and the shoulder.

   Hinge Joint : This kind of joint provides back and froth movement similar to the hinges of a door.

   Examples : Joints at the knee and the elbow.

   (ii) **Bones and Cartilage :** Bones are hard structures while cartilages are soft and elastic and can be easily bent.

   (iii) **Movable Joints :** These joints allow free movements of bones in various directions.

   Examples :

   (a) Joints in the elbow. (b) Joints in the knee.

   (c) Joints in the shoulder. (d) Joints in the neck.

   Immovable Joints : These joints do not allow any movement.

   Examples :

   (a) Joints between the bones of the skull

   (b) Joints between the upper jaw and the rest of the head

   (c) Joints between the tooth sockets

F. Long Answer Type Questions.

1. Animals need to locomote because they need to:
   (i) Search for food, water and shelter.
   (ii) Escape from danger
   (iii) Avoid un favorable conditions
   (iv) Reproduces or to find a mate.
2. **Snail :** A snail creeps along on a strong muscular organ called a foot. The muscles of its foot move in backward, wave-like motion that propels the snail forward. The moving snail pours out a sticky slime, called mucus which helps the snail move by reducing the friction between body and ground.
3. Cockroaches have three pairs of jointed legs which help them in walking and two pairs of wings which help them to fly.
   (i) Muscles present near the legs help in walking.
   (ii) Breast muscles attached to the wings help in flying.
4. The snake's body curves into many loops. Each loop gives the snake a forward push by pressing against the ground. The thrust given by all the loops together allows the snake to move forward very fast in a wave-like manner.

5. **Joints :** Joints are places where two or more bones meet. The bones are held together at the joints by strong structures called ligaments.

   Type of Joints : The are three main types of joints in human body :

   (i) **Immovable Joints :** These joints do not allow any movement.

   Examples :

   (a) Joints between the bones of the skull

   (b) Joints between the upper jaw and the rest of the head

   (c) Joints between the tooth sockets

   (ii) **Slightly Movable Joints :** These joints allow very little movement.

   Examples :

   (a) Joints between adjacent vertebrae in the backbone

   (b) Joints between the ribs and the breastbone

   (ii) **Movable Joints :** These joints allow free movements of bones in various directions.

   Examples :

   (a) Joints in the elbow (b) Joints in the knee

   (c) Joints in the shoulder (d) Joints in the neck

   The four major movable joints in our body are :

   (i) **Ball and socket Joint :** In this type of joint, the ball-like surface of one bone fits into a cup-like hollow in the other. A ball and socket joint allows maximum movement in all directions.

   Examples : Joints at the hip and the shoulder.

   (ii) **Pivot Joint :** In this joint, the rounded surface of one bone fits into a ring formed by the other, such that one bone is able to rotate over the other.

   Example : Joint where the neck joins the head.

   (iii) **Hinge Joint :** This kind of joint provides back and froth movement similar to the hinges of a door.

   Examples : Joints at the knee and the elbow.

   (iv) **Gliding Joint :** This kind of joint allows bones to glide over each other, providing little movement in all directions.

   Example : Joints at the ankle and the wrist.

6. The skeletal system performs the following functions:

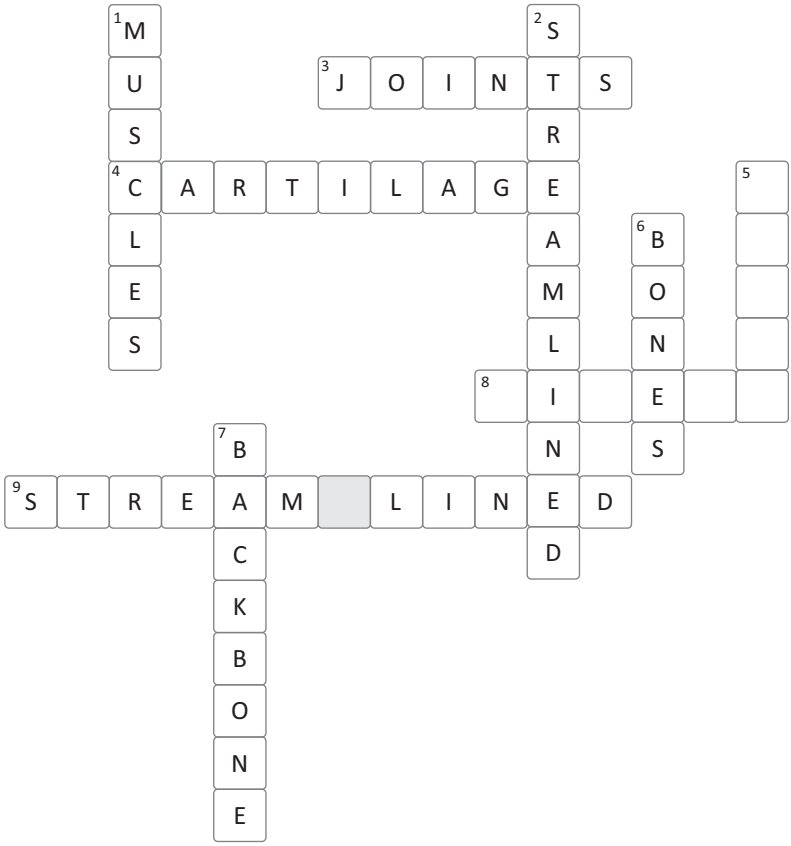
   - It provides shape and support to the body.
   - It protects the soft internal organs like heart, stomach and liver.
   - Bones are filled with a substance called bone-marrow, which produces the blood cells.

- It helps in the movement of various body parts.

7. Our body has three types of muscles :
   - Skeletal muscles • Smooth muscles • Cardiac muscles
8. When one muscle contracts, it pulls the bone and moves it, meanwhile the other muscle relaxes. To move back the bone, the other muscle contracts while the former relaxes. For example, biceps and triceps work together to bend and extend the arm. Biceps contracts when we pull our forearm towards the shoulder meanwhile triceps relaxes. When the later contracts to extend the arm, the former relaxes.

Learn by Doing

C. PUZZLE



Measurement and Motion

A. Tick (3) the correct option.

1. (c) 2. (c) 3. (a) 4. (b) 5. (d) 6. (b) 7. (d)

B. Fill in the blanks with correct words.

1. non-standard 2. metre 3. eye 4. thread
5. periodic 6. rotatory 7. Periodic

C. Match the Following.

1. c 2. d 3. b 4. a 5. e

D. Short Answer Type Questions.

1. Ancient people used several method to measure length and distances. People used to their body parts to designate a particular unit for measurement of length, e.g. hand span, cubit and fathom.
2. (a) **Handspan** : It is the distance between the tip of the thumb and the tip of the smallest finger when the had is stretched fully.
   (b) **Cubit** : It is the distance between the tip of the middle finger of the outstretched hand and the elbow.
   (c) **Arm Length :** The length between the shoulder and tip of the middle finger is called arm length.
   (d) **Footstep :** The length between the tip of the great toe and the heal of the foot is known as footstep.
   (e) **Translatory Motion :** If one object moves in a line, straight or curved, its motion is said to translatory.
   (f) **Circulatory Motion :** Some objects move in a circle. Their motion is called circulatory motion.
3. **Solution :** We know that 1000 m = 1 km
   Therefore 5000 m = 5 km
   Thus, the distance between the two houses in 5 km.
4. In order to measure the length of a straight line, keep the scale in such away that the graduated edge should be placed closed to the line and the zero mark of the scale coincides with one end of the line. Keeping the exactly above the point where the measurement is to be taken. Note down the reading on scale coincides with the other end.
5. (a) Curvilinear Motion (b) Rotatory Motion
   (c) Rectilinear Motion (d) Rotatory Motion

(e) Periodic Motion (f) Circular Motion (g) Periodic Motion

6. **Periodic Motion :** Those motions which repeats them selves at regular intervals of time are called periodic motion.

   Examples :

   The motion of a clock pendulum. The rotation of earth on its axis.

   Non-periodic Motion : Any type of motion that does not repeat is self after equal intervals of time is called non-periodic motion.

   Examples :

   A car moving on a road. A bird gliding across the sky.

E. Long Answer Type Question.

1. **Measurement :** Measurement can be defined as an act of determining an unknown quantity such as length, distance, weight or time.

   We need a standard unit for measurement to make our judgment more reliable and accurate.

2. (i) **Fins in Fish :** They help to keep the balance of the body and to keep direction while swimming.

   (ii) **Scales and muscles in a shake :** Scales on snake helps them to crawl and climb. And the muscles help snake to move.

3. We should take the following precautions while using devices for measuring lengths.
   - Place a scale in contact with the object along its length.
   - The eye must be positioned in front of and in line where the measurement is to be taken.
   - The ends of the scale (or rod) must not be worn out. If the ends of the scale are broken and the zero mark cannot be read clearly, then use some other digit (say mark 1) can be taken as the initial reading. Subtract the initial reading from the reading at the other end to get an accurate measurement of the length.
   - The scale should be placed correctly along the length to be measured.

4. (i) **Rotatory Motion :** When an object moves round without changing its position, the object is said to be in rotatory motion. In rotatory motion the object spins about an axis, staying at the position.

   (ii) **Circulatory Motion :** Circular motion is describe as a movement of an object while rotation along a circular path.

5. An oscillatory motion is always periodic bu a periodic motion is not always oscillatory because in oscillatory motion the body rackets its path in equal intervals of time but any body in periodic motion may not do to and formation about their mean position.

Electricity And Circuits

A. Tick (3) the correct option.

1. (d) 2. (c) 3. (d) 4. (b) 5. (b) 6. (b)

B. Fill in the blanks with correct words.

1. charges 2. battery 3. sunlight
4. circuit 5. Insulators 6. plastic

C. Match the Following.

1. e 2. a 3. d 4. c 5. b

D. Short Answer Type Questions.

1. (a) **Electric Cell**: An electric cell is the simplest unit for generating electric current.
   (b) **Battery** : A battery is a combination of two or more cells in series.
   (c) **Conductors :** Materials which allow the electric current to flow through them are called conductors.
   (d) **Insulators :** Materials which do not allow electric current to flow through them are called insulators.
2. Electric current is a type of energy. It is caused due to the flow of electrons.
3. The complete pate ho flow of electricity from one terminal of an electric cell through the bulb and other electrical components to the other terminal of the electric cell is called an electric circuit.
4. An electric cell is the simplest unit for generating electric current while a battery is a combination of two or more cells in series.
5. A switch is a device that completes of brakes a circuit. Electric switches are used at home to switch ON or OFF the bulb, tube, light, fan and other electrical equipment.
6. When the switch is pushed to the ON position, the circuit is Complete (closed) and the bulb glows. When the switch is pushed to the OFF position, the circuit is incomplete (open). Now, the current cannot flow through the circuit and the light goes out.
7. On observing an electric bulb carefully, your will find that wire inside the glass case is made of tungsten. It is either coiled or straight. It server as a filament of the bulb. The electricity passes through the filament. As a result it gets heated up and gives out light.

8. **Conductors :** Human body, metallic wire, in pure water pencil lead.

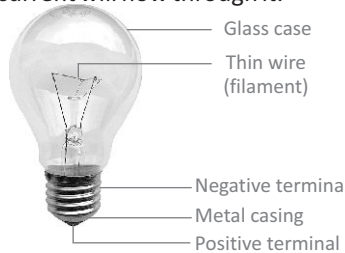
   Insulators : Air, distilled water, wood, silk, wood, plastic box, polythene bag, rubber; eraser and plastic scale.

E. Long Answer Type Questions.

1. A switch is a device that completes of brakes a circuit. Electric switches are used at home to switch ON or OFF the bulb, tube, light, fan and other electrical equipment.
2. Materials which allow the electric current to flow through them are called conductors. Examples of good conductors are metals like silver, copper, iron, aluminium, etc. Non-metals like graphite and gas carbon are also good conductors.

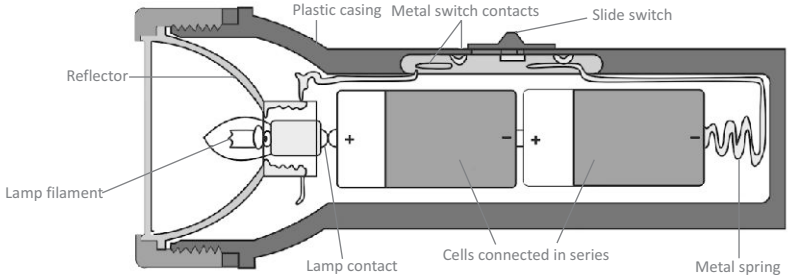
   Materials which do not allow electric current to flow through them are called insulators. Examples of insulators are rubber, plastic, dry wood, asbestos, wax, mica, etc.
3. The dry cell contains a paste of ammonium chloride inside a zinc container. Inside the paste, a cardboard container containing powdered manganese dioxide and carbon is placed. The cardboard container has microscopic holes in it (such materials are called porous materials) through which a chemical reaction takes place between ammonium chloride paste and powdered manganese dioxide. A rod usually carbon, with a metal cap is dipped into the manganese dioxide. The whole thing is then sealed (with only the metal cap sticking out). So that the contents do not spill out. The zinc can is also wrapped so that only the base is exposed. Every source of electric current has two ends where conducting wires are connected to draw electric current. These two ends are called terminals of a cell. The tip of the metal cap and the base of the zinc can are called the positive and negative terminals of the dry cell respectively.

   Electric current can be thought of as 'flowing in' from one terminal and 'flowing out' from the other. If the tip of the metal cap and the base of the zinc can are connected by a metal wire, current will flow through it.
4. On observing an electric bulb carefully, your will find that wire inside the glass case is made of tungsten. It is either coiled or straight. It server as a filament of the bulb. The electricity passes through the filament. As a result it gets heated up and gives out light.



An electric bulb

5. An electric torch has one or more dry cells inside, which act as the 'source'. These cells are connected through a switch to a small bulb.



Schematic diagram of an electric torch

When the switch is pushed to the ON position, the circuit is complete (closed) and the bulb glows. When the switch is pushed to the OFF position, the circuit is incomplete (open). Now, the current cannot flow through the circuit and the light goes out.

6. (i) Metals are good conductor of heat and electricity. Therefore, electrical wires are made up of metals.

   (ii) The outer covering of electric wires is made of plastic because plastic is an insulator of electricity. The plastic outer covering does not allow the electric current to pass through it and reach us.

7. **Aim :** To make an electric switch and a torch.

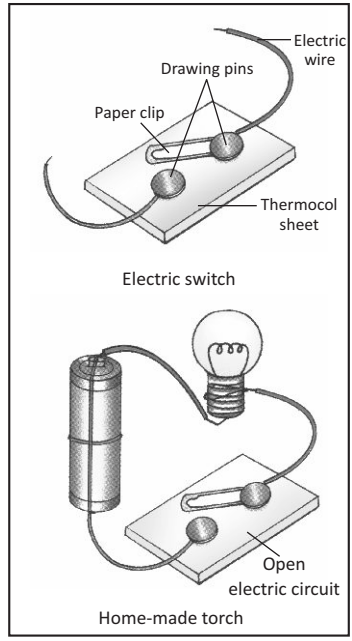
   Materials Required : A paper clip or a safety pin, two drawing pins, a small sheet of thermocol or a wooden board, electric wires, an electric bulb and an electric cell.

   Procedure :

   1. Insert a drawing pin at one end of the paper clip.
   2. Insert the drawing pin along with the paper clip in the thermocol sheet ensuring that it rotates freely.
   3. Insert the other drawing pin in the thermocol sheet in such a way that the free end of the paper clip can touch the pin easily.

   The electric switch is now ready.

   4. Join one electric wire each to the two drawing pins.
   5. Now, connect the electric bulb, the electric cell and the electric switch as shown in the figure given alongside.



6. Touch the free end of the paper clip with the other drawing pin.

Observation : You will observe that the electric bulb starts glowing. The paper clip and the drawing pins are made of metal. On touching these two, the electric circuit completes. In this condition, the switch is said to be ON and the electric bulb glows. When the paper clip and the drawing pins are not touching each other, then the switch is said to be OFF and the electric bulb does not glow.

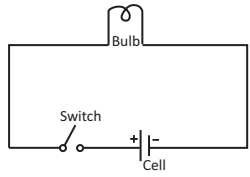
8. **Aim :** To classify some common materials as insulators and conductors.

Materials Required : Copper coin, eraser, iron nail, piece of wood, plastic.

Procedure :

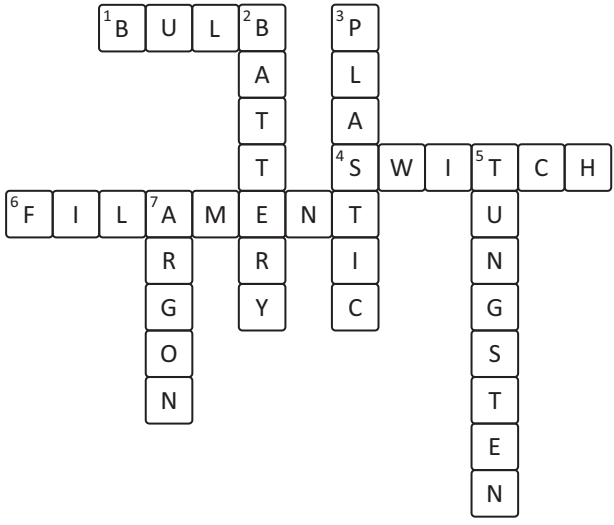
1. Make the connections according to the circuit diagram.
2. Now, place the above objects one by one in the switch such that the two ends of the wire touch the two ends of the object.
3. Note down your observations in the given table.

Material	Does the bulb glow or not?	Wheather insulator (I) or conductor (C)
Copper Coin	Yes	(C)
Eraser	No	(I)
Iron nail	Yes	(C)
Wood	No	(I)
Plastic	No	(I)



Learn by Doing

C. PUZZLE



Fun With Magnets

A. Tick (3) the correct option.

1. (d) 2. (b) 3. (d) 4. (c) 5. (d) 6. (d) 7. (a)

B. Fill in the blanks with correct words.

1. natural 2. repel, unlike 3. magnetic
4. compass 5. pairs 6. Magnetism

C. Match the Following.

1. d 2. b 3. e 4. c 5. a

D. Short Answer Type Questions.

1. Iron and Cobalt
2. If we break a magnet in the middle, we would get two pieces, each having a North Pole and South Pale.
3. **Magnetic Material :** Substances which are strongly attracted by a magnet are called magnetic substances, e.g., iron, cobalt, nickle and alloys of carbon and iron.

   Non-magnetic Material : Substances which are not attracted by a magnet are called non-magnetic substances, e.g., brass, paper, stone, gold, silver, etc.
4. An instrument that is used to find the direction is called Compass. Compass is used to navigate on land, at sea or in the air.
5. The Property of attraction exhibited by a magnet, to a magnetic material is known as magnetism.
6. **Magnetic :** Iron almirah, an iron lamp shade, iron clips, needle car, iron gate.

   Non-magnetic : A wooden table, plastic geometry box, paper, rubber wool, cloth, curtains, book.
7. Two properties of magnets :–
   (i) Magnet attracts magnetic materials like iron, cobalt, nickel.
   (ii) Like poles of a magnet repel each other and opposite: poles of a magnet at tract each other.

   Two uses of magnets :
   (i) Magnets are used in electric motors. generators, speakers etc.
   (ii) Television and computer monitors have magnetic strips in their circuits.

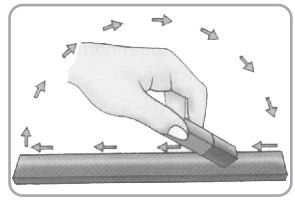
D. Short Answer Type Questions.

1. Around 4000 years ago, a shepherd boy named magnes lived in an ancient Greek town called Magnesia. He would carry a stick which had a small piece of iron attached at one end to control his herd. One day while his cattle were grazing in the mountains, his stick touched a rock. As he tried to remove it did not come off easily. This rock was the first magnet discovered by man. The rock was named magnetite after magnes and it was found that its main constituent was iron. The word magnet comes from the name of the town magnesia where the first magnet was discovered.
2. When magnetic materials (such as iron fillings) are brought close to a magnet, they stick mostly at the two ends of the magnet. These are called the poles of the magnet. Magnetic forces are the strongest at the poles.

   There are two types of poles in every magnet, irrespective of its shape. These are boy convention, called the North Pole (N) and the South Pole (S).
3. When two magnets are brought near each other, they are either pulled towards each other or pushed away from each other. This pulling of magnets is called attraction of magnets and the pushing away from each other is called repulsion of magnets. The repulsion or attraction of magnets depends on the fact that which poles of magnets are facing each other. Like poles of magnets (N-N or S-S) repel each other, while unlike poles (N-S or S-N) attract each other. Let's understand this property of magnets through the following activity.
4. (a) The magnets will repel each other.

   (b) The magnets will attract each other.
5. The following cautions must be taken to keep the magnets safe.
   - They should not be heated, hammered or dropped from a height.
   - Bar magnets should be kept in pairs with opposite poles on the same side. They must be separated by a piece of wood as shown in the figure given alongside.
   - For keeping safe a horseshoe-shaped magnet, a piece of iron should be kept across its poles.
   - Magnets should be kept away from all the electronic devices like television, music system, loud speakers and computer printers.
6. Take a piece of iron and place it on a table. Now take a bar magnet and place its one pole near one of the ends of the iron piece. Without lifting the bar magnet, move it along the length of the iron piece till you reach

the other end. Now lift the bar magnet and bring the same pole to the same point of the iron piece from which you began. Move the bar magnet again along the iron piece in the same manner as you did before. Repeat this process about 30-40 times. Bring an iron object near the iron piece to check whether it has magnetised or not. If not, repeat this process for few more times.



Making your own magnet

7. **Aim :** To show that the power of a magnet is the strongest at its poles.

Materials Required : A bar magnet, iron filings and a sheet of paper.

Procedure :

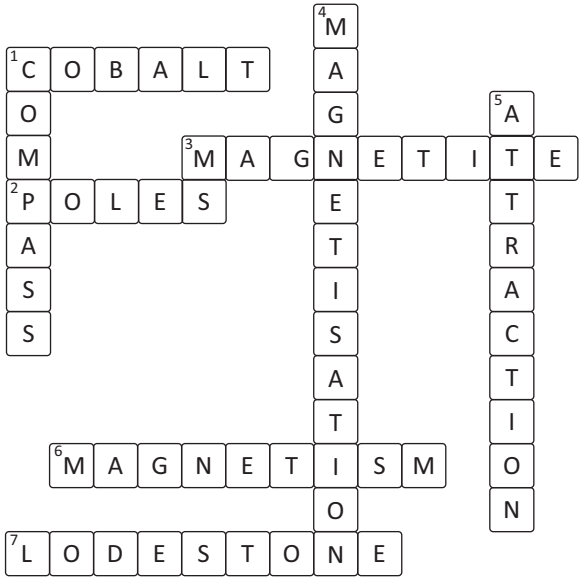
1. Take some iron filings and spread them on a sheet of paper.
2. Roll the bar magnet over them and lift it up.
3. Now remove the iron filings and repeat these steps.

Iron pins sticking to the magnet

Observation : You will observe that the iron filings or clips mostly stick near the two ends of the magnet every time you repeat the steps. This proves that the power of a magnet is the strongest at its poles.

Learn by Doing

C. PUZZLE



Light

A. Tick (3) the correct option.

1. (d) 2. (b) 3. (d) 4. (d) 5. (d) 6. (c) 7. (d)

B. Fill in the blanks with correct words.

1. Primary 2. bean 3. opaque 4. eclipse
5. rectilinear or motion 6. Reflection 7. Shadow

C. Match the Following.

1. b 2. c 3. a 4. e 5. d

D. Short Answer Type Questions.

1. Light is a form of energy that produces sensation of light.
2. Luminous Bodies : Those bodies which have light of their own are called luminous bodies.

   Examples : the sun, the stars, the incandescent lamps and candle flame.

   Non-luminuous Bodies : Those bodies which have no light of their own, but they can reflect light.

   Examples : the plants, moon, wood, stone, etc.
3. **Characteristics of a Shadow:**

   (i) A shadow is always black irrespective of the colour of the object used to make the shadow.

   (ii) It only shows the outline or the shape of the object but not the details of the object.

   (iii) The size of a shadow varies depending on the distance between the :

   • object and the screen, and • object and the source of light.
4. Reflection is the phenomenon of bouncing back of light from the surface of an object. This gives rise to image formation.
5.

   (i) No shadow is formed in case of a transparent object.

   (ii) Light shadow is formed in case of a translucent object.

   (iii) Dark shadow is formed in case
6. An inverted image is formed in a pinhole camera because the light rays coming from the top and bottom of the object Cross-over (or intersect) at the pinhole.

7. **Transparent:** Clean water, air, clear plastic scale, polythene sheet, plane glass, spectacles.

   Translucent : Brown paper, waxed paper, thin muslin cloth, dense, smoke, fog.

   Opaque : Rock, aluminum sheet, wooden box, a CD (compact disc), milk, carbon paper, a wall.

E. Long Answer Type Questions.

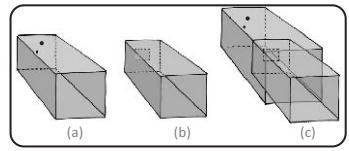
1. **Aim :** To make a pinhole camera.

   Materials Required : Two empty boxes that can slide into one another (one box slightly bigger than the another), paper cutter, tracing paper, a lamp or a candle and a black cloth.

   Procedure :

   (i) Take two boxes and remove their lids (or any one side).

   (ii) On the side opposite to the open side of the larger box, make a small pinhole in the centre. [Fig. (a)].



A pinhole camera

   (iii) On the same side of the small box, cut out a square in the centre with a side of about 5 to 6 cm.

   (iv) Cover the open square with the tracing paper (translucent screen) and secure it in position by using some suitable tape [Fig. (b)].

   (v) Slide the smaller box inside the larger box such that the side with tracing paper is inside [Fig. (c)].

   The pinhole camera is now ready for use.

   - Try to look at a well-illuminated object say a lamp, through the pinhole camera from the open face of the smaller box.
   - Cover the pinhole camera and your head with a piece of black cloth.
   - Adjust the position of the pinhole camera forward or backward to get an image of the object on the tracing paper.

   What kind of image is formed on the tracing paper?

   Observation : You will observe that the image formed on the tracing paper is upside down. This is because light travels in a straight line. The light from the top of the object travels in a straight line through the pinhole and continues until it hits the bottom of the tracing paper. Similarly, the light from the bottom of the object hits the top of the tracing paper. The image thus formed is upside down.

2. **Aim :** To show that light travels in a straight line.

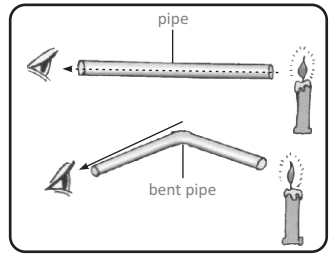
   Materials Required : A narrow long hollow tube, a curved hollow tube and a lighted candle.

Observation :

(i) Take a lighted candle and try to observe the candle through the straight hollow tube.

(ii) Now, observe the candle through the curved (bent) tube.

Observation : The candle becomes clearly visible when see through the straight hollow tube but when seen through the curved hollow tube, it cannot be seen.



Light travels in a straight line

Result and Conclusion : Thus we can infer that light travels in a straight line.

3. The differences between opaque, translucent, and transparent are :

- Materials that allow all the light pass through them are called transparent materials. We will be able to see through these materials very clearly.

  Examples of transparent materials are clear air, clear glass, clean water, same kinds of plastic and cellophane paper.
- Materials that transmit some amount of light are called translucent materials. We will not be able to see through these materials clearly. Examples of translucent materials are butter paper, a sheet of paper smeared with oil and smoked glass.
- Materials that completely block light are called opaque materials. We will not be able to see through these materials at all.

  Examples of opaque materials are metals, mud, cement, coal and wood.

4. An area of darkness formed by an opaque object obstructing light is called a shadow.

   If an opaque substance is kept between the source of light and a screen, the light does not pass through it. We can say that the shadow of the substance on the screen remains unlighted. The unlighted portion is the shadow.

   Characteristics of a Shadow:

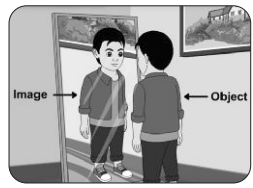
   (i) A shadow is always black irrespective of the colour of the object used to make the shadow.

   (ii) It only shows the outline or the shape of the object but not the details of the object.

   (iii) The size of a shadow varies depending on the distance between the :

   - object and the screen, and
   - object and the source of light.

5. The difference between the shadow and the image of an object in a mirror are:



Lateral inversion

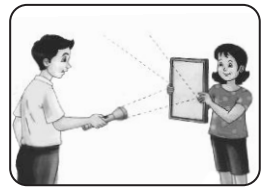
- The length of a shadow changes with the change in the position of object with respect to the source of light.

  The length of the image in a mirror always remains the same, i.e., equal to the size of object at all positions.
- The shadow is always black in colour irrespective of the colour of object and the colour of light. The details of the object cannot be seen in its shadow.

  The image in a mirror is of the same colour as the object. The details of the object can be seen in its image.
- The shadow has no lateral inversion.

  The image formed in a mirror is laterally inverted.

7. **Aim :** To observe and understand the reflection of light.



Go to a dark room with your friend. Take a mirror and a torch along with you. Switch off the lights of the room. Ask your friend to hold a mirror and stand in front of you at a distance. Directs the torch light onto the mirror.

What do you observe?

You will observe a patch of light on the other side (wall) of the room. This shows that mirror reflects the light rays. Now either change the direction of the torch or the direction of the mirror. What do you observe now?

You will now observe a patch of light but on some other side (wall) of the room. This shows that a mirror changes the direction of light that falls on it.

Light

A. Tick (3) the correct option.

1. (c) 2. (d) 3. (b) 4. (d) 5. (d)

B. Fill in the blanks with correct words.

1. atmosphere 2. oxygen 3. Oxygen 4. Air 5. crops

C. Match the Following.

1. e 2. a 3. d 4. b 5. c

D. Short Answer Type Questions.

1. Thick blanked of air surrounding the eat the surface in called the atmosphere.
2. Human beings take in oxygen from air and breathe out carbon-dioxide. Oxygen is necessary for them to get energy. Whenever we breathe, our body gets oxygen it needs from air. It breaks down the food we eat in our body and provides energy. Thus, without oxygen (air) our body cannot use the food we eat.
3. The animals living in soil breathe in air trapped the particles of soil.
4. The amount of water vapour present in the air is called humidity.
5. (i) Planting more and more trees. (ii) Recycling plastics.

E. Long Answer Type Question.

1. Air contains mainly nitrogen, oxygen and remaining includes carbon dioxide, noble gases, water vapour, dust particles and traces of other gases.

   Nitrogen

   Air contains about 78% nitrogen. Nitrogen does not support burning or combustion. Plants need nitrogen to grow.

   Oxygen

   Around 21% of the air is made up of oxygen. Oxygen is life-supporting gas and is essential for all living organisms. It is necessary for all the life processes and for processes like combustion or burning. Oxygen supports combustion.

   Carbon Dioxide

   Air contains about 0.03% of carbon dioxide. Plants and animals take in oxygen and give out carbon dioxide during respiration. During burning, carbon dioxide is also produced.

   Water Vapour

   Water is present in the form of vapour in the atmosphere. This vapour is released due to evaporation of water from water bodies on the earth as a part of the water cycle.

   Dust and Smoke

   Air around us also contains suspended dust particles and smoke. Smoke is released when fuels are burnt. It consists of gases and find dust particles. These are harmful for the living organisms.

6. As we go higher and higher in the atmosphere, the availability of air goes on decreasing. One feels difficulty in breathing at a high altitude. This is

the reason why mountaineers, astronauts and miners carry oxygen cylinders with them for respiration.

3. **Aim :** To show that oxygen is necessary for combustion.

   Materials Required : Glass bowls, glass tumbler, candle

   Procedure :

   Take a wide glass bowl and place a candle in the middle of it. Fill the bowl with water. Light the candle and cover it with an inverted glass tumbler. Observe what happens to the burning candle and level of water.

   Observation : It is observed that the candle continues to burn for some time and then stops. This happens because the oxygen present in the tumbler is used up. As the space occupied by the oxygen in the glass tumbler is used up, the water rises to occupy the space. Hence, the level of water increases.

4. **Aim :** To observe the air dissolved in water

   Materials Required : Beaker, tripod stand, burner and water

   Procedure :

   - Take some water in the beaker.
   - Heat it slowly on the tripod stand over the burner.
   - Look at the inner surface of the glass vessel or beaker.

   Observation :

   You will notice tiny bubbles on the inner surface of the beaker. These are bubbles of air dissolved in water. On heating, the air dissolved in water escapes.

5. Air pollution ix the addition of contaminated substances in the environment in quantities that are harmful to diving beings. These unwanted substances are called pollutants.

   Burning of fuels such as coal and petroleum, excessive burning of fuels such as wood and cool, smoke and harmful gases released from industries, smoke released by vehicles and machines releasing gases are the major causes of air pollution.