ADDITIONAL®
PRACTICE

SCIENCE 6

Answer Key

DNA education
New Delhi-110002

Chapter

01 Components of Food

WORKSHEET - 1

1. (a) (ii) (b) (iii) (c) (iii)
   (d) (i) (e) (iv) (f) (iv)
   (g) (iii)

2.

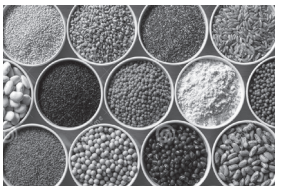
(a)	Food rich in carbohydrates	Potato	Rice
(b)	Food rich in proteins	Gram	Pea
(c)	Food rich in fats	Milk	Ghee
(d)	Food rich in fibres	Pear	Carrot
(e)	Food rich in Vitamin A	Papaya	Carrot
(f)	Food rich in iron	Spinach	Beans

3. (a) deficiency (b) sun (c) body-building
   (d) balanced (e) violet

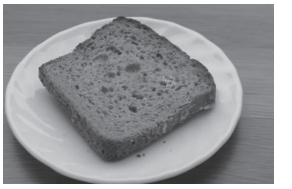
4.

Protein

Protein

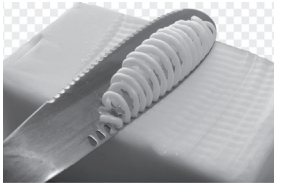


Protein



Carbohydrate

Carbohydrate



Fat

Vitamin

Mineral

5. (a) These are sugars, starches and fibres found in fruits, vegetables, grains and milk.
   (b) These are diseases caused by the deficiency of nutrients.
   (c) Roughage is dietary fibres that are helpful in the digestion of our food.

6.

Vitamin/Mineral	Deficiency Disease	Symptoms
a. Vitamin A	Loss of vision	Poor vision, loss of vision in dark
b. Iron	Anaemia	Weakness
c. Iodine	Goiter	Swollen neck
d. Vitamin B1	Beri Beri	Weak muscles, less energy
e. Vitamin C	Scurvy	Bleeding gums
f. Vitamin D	Rickets	Soft and bent bones

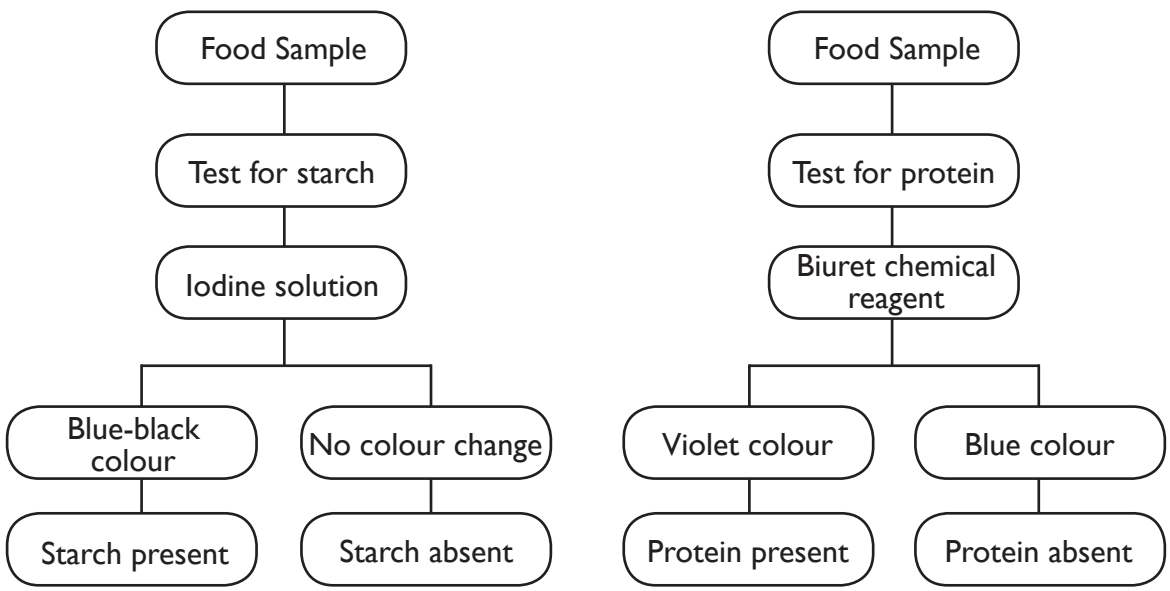
7. (a) (iv) (b) (vi) (c) (i)
(d) (iii) (e) (ii) (f) (v)

8. (a) Carbohydrates and fats (b) Skin disease or diarrhoea
(c) Iodine (d) Lethargy/weakness

9. (a) T (b) F (c) T
(d) T (e) F

10. (a) We get vitamin D from the sun.
(b) Vitamins A, C and K are found in green vegetables.
(c) Wheat, bread, maize, corn, rice, potato, sugercane, milk, bajra, papaya, mango, melon, sweet potato, honey are sources of carbohydrates.
(d) Vegetable soup
(e) Fats provide more energy than carbohydrates.

11. (a) Protein is a dietary component essential for growth. Gram and soyabean provide proteins.
(b) Animal proteins have higher cholesterol level and are easily digestible in comparison with plant proteins.
(c) Fats provide energy, absorb nutrients and maintain our body temperature.
(d)



(e) Proteins are needed for growth and repair of our body. They also regulate body processes.

(f) It is a diet containing all the nutrients in the right quantities. It should contain carbohydrates, proteins, fats, vitamins, minerals, water and roughage.

12. (a) The disease shown is rickets. Weak and soft bones are its symptoms. It can be prevented by taking vitamin D rich diet like chicken, egg-yolk, milk, butter, etc.

(b) Water helps in dissolving minerals and other nutrients in the body. It helps in throwing out wastes from body as urine and sweat. It carries nutrients and oxygen to cells in the brain and other parts of the body.

13. Minerals and vitamins are essential because minerals help in proper growth of body and in maintaining good health while vitamins help in protecting our body from diseases and keep our eyes, bones, teeth and gums healthy.

ACTIVITY ZONE

(a) roti
(b) Pea, cabbage, orange
(c) Butter
(d) protein, calcium
(e) Papaya
(f) iron
(g) milk, proteins

WORKSHEET - 2

1.

Carbohydrates	Proteins	Fats
Rice	Meat	Butter
Bread	Fish	Oil
Whole grains	Beans	Nuts
	Pulses	Cheese

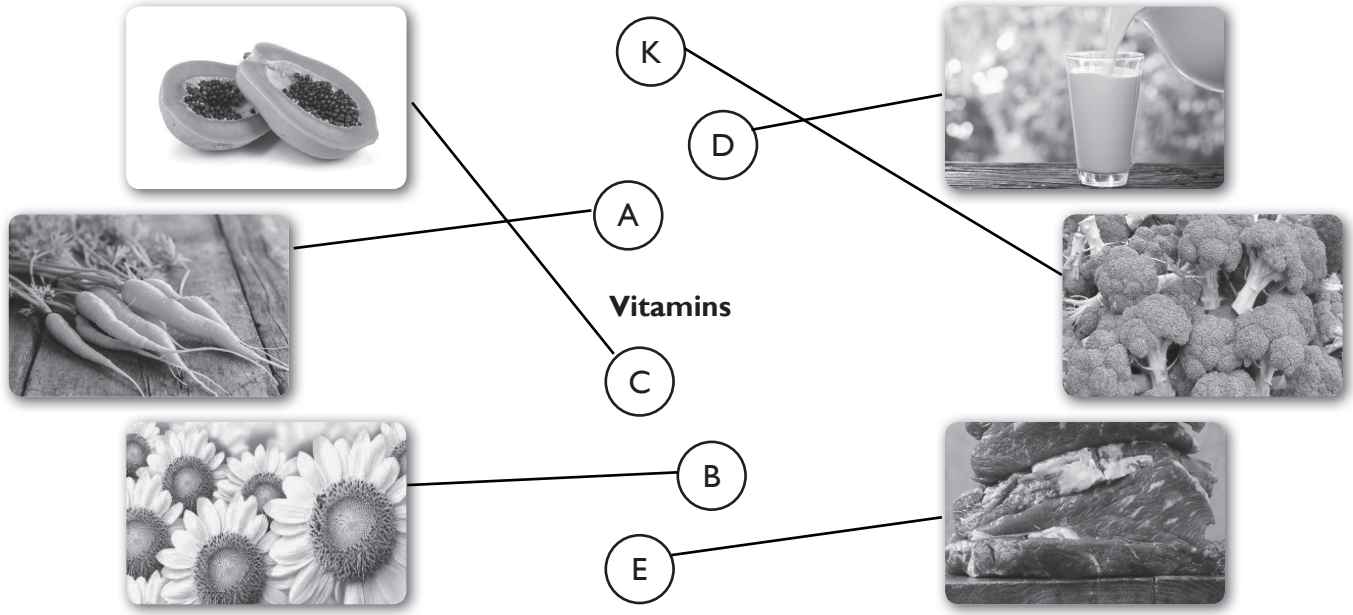
2. (a) Butter (b) Mineral (c) Deficiency diseases
(d) Protein (e) Obesity

3. (a) (i) (b) (iii) (c) (iv)
(d) (iv) (e) (iv) (f) (iv)

4. (a) vitamin C (b) Carbohydrate (c) vitamin C
(d) proteins (e) Water

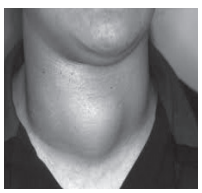
5. (a) T (b) F (c) T
(d) T (e) T

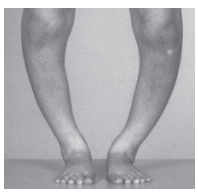
6.



7. (a) Anaemia (b) Tomato
   (c) Anaemia (d) Vitamin C

8.


Goitre


Rickets


Kwashiorkor


Scurvy

9. (a) Vitamins are nutrients found in our food which protect us from diseases.
   (b) Fats lead to obesity.
   (c) Proteins should be given in more quantity to growing children.
   (d) Vitamin D

10. (a) Roughage is the dietary fibres that are helpful in the digestion of food. Its sources are whole grains, pulses, potato, fruits and vegetables.
    (b) Vitamins which are soluble in water are called water-soluble vitamins. Vitamins B and C are water-soluble vitamins.
    (c) (i) (a) Protein (b) Vitamin
    (ii) Proteins are needed for growth and repair of our body. Vitamins protect our body from various diseases.
    (d) Minerals help in proper growth of our body. They also maintain good health.
    (e) Because a balanced diet contains all the nutrients which help in proper growth and repair of our body, and prevent us from various diseases.
    (f) Because milk contains protein, carbohydrate, fat, all known vitamins and various minerals essential for sustaining life and maintaining good health.

11. (a) Dehydration is the reduction in the amount of water in the body. It can be controlled by replenishing the fluid level in the body.

(b) Goitre is a sign of iodine deficiency. Sea-food is rich in iodine hence people who eat it, do not suffer from goitre.

12.

Food Item	Colour with iodine solution	Colour with Biuret reagent	Oily patch on paper (yes/no)	Nutrient present
Bread	Blue-black	—	No	Starch
Soyabean	—	Violet	—	Protein
Paneer	—	Violet	No	Protein
Potato	Blue-black	—	No	Starch
Rice	Blue-black	—	No	Starch
Groundnut	—	Violet	Yes	Protein/fat
Boiled egg	—	Violet	No	Protein

ACTIVITY ZONE

Do it yourself.

Chapter 02 Sorting Materials into Groups

WORKSHEET - 1

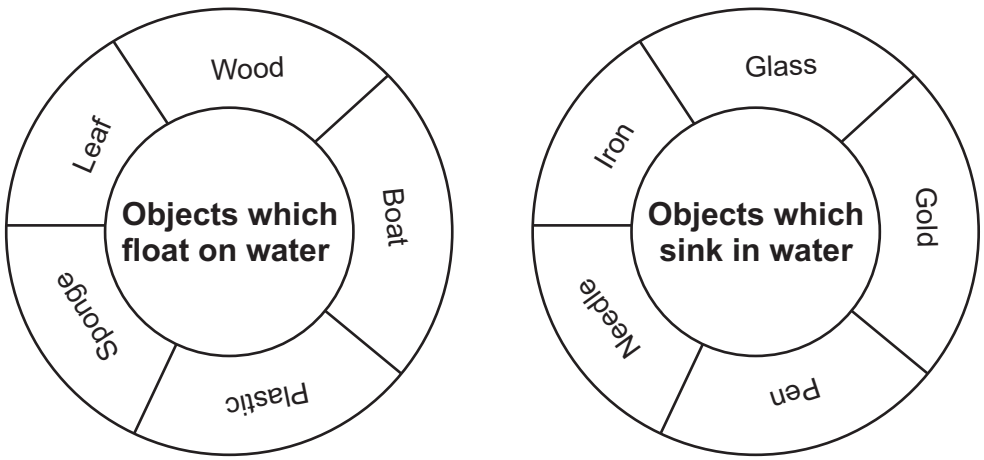
1. (a) (iii) (b) (v) (c) (i)
   (d) (ii) (e) (iv)
2. (a) Soft (b) Oil
   (c) Silk (d) Chalk
3.

Floats on Water	Wood	Leaf
Compressible	Sponge	Wool
Insoluble in water	Oil	Ghee

4. (a) (iv) (b) (ii) (c) (iii)
   (d) (ii) (e) (iii)

5. (a) F (b) F (c) F
   (d) T (e) T

6.



7. (a) Wood (b) Red chillies (c) Iron nail
   (d) Rose (e) Stone

8.

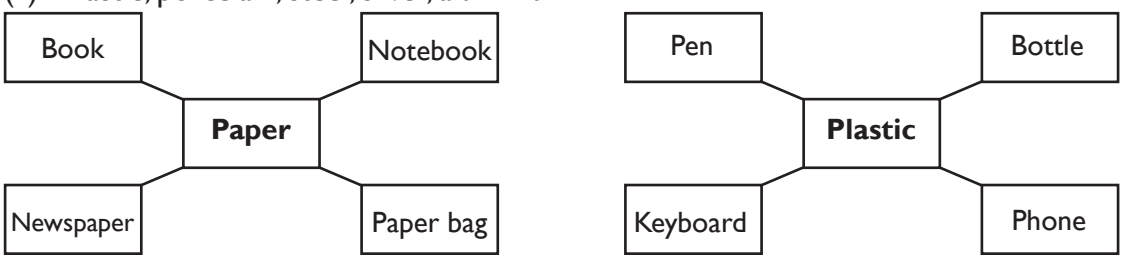
a.	Materials that are dull in appearance	Wood	Plastic
b.	Materials that are miscible in water	Vinegar	Lemon juice
c.	Liquids that are immiscible in water	Mustard oil	Kerosene
d.	Examples of matter	Salt	Milk

9.

Transparent	Translucent	Opaque
Mirror	Coloured glass	Seeds
Spectacles	Crushed glass	Blackboard
Goggles	OHP sheets	Calculator
Car windows	Window glass	Drawing sheets

10. (a) No, they are not miscible.
(b) Transparent containers made of glass are used by the shopkeepers.
(c) Lemon juice mixes well because it is miscible in water.
(d) Opacity/opaqueness

11. (a) Sorting of materials is necessary to classify them as per their usage. Grouping of materials saves our time, energy and makes our study easier.
(b) (i) Plastic, metal, ink
(ii) Plastic, porcelain, steel, silver, aluminium
(c)



(d) Objects which are lighter (not very dense), float on water, like wood and paper, while those that are heavy (dense), sink in water, like stone. This property is called density.
(e) A solution is a mixture of two or more substances. In a solution, a solute is a substance dissolved in another substance, called solvent. To make a salt solution, add a spoonful of salt into a glass full of water and stir it with a spoon for a few minutes.

12. (a) When one liquid is added to another liquid and they dissolve completely, these are called miscible. But if one liquid floats on or settles at the bottom of the other liquid, they are said to be immiscible.
(b) Solubility of a substance increases with increase in temperature. Higher temperature allows the solvent molecules to more effectively break apart the solute molecules thus increasing the solubility.

13. Soluble – Sugar, salt, glucose, honey

Insoluble – Mustard oil, sawdust, chalk powder, petals of flower, copper, wheat flour

ACTIVITY ZONE

Appearance		Hardness		Solubility in water	
Lustrous	**Non-lustrous**	**Hard**	**Soft**	**Soluble**	**Insoluble**
Bangles	Chalk	Wood	Sponge	Sugar	Oil
Bracelet	Pen	Wire	Paper	Milk	Sand

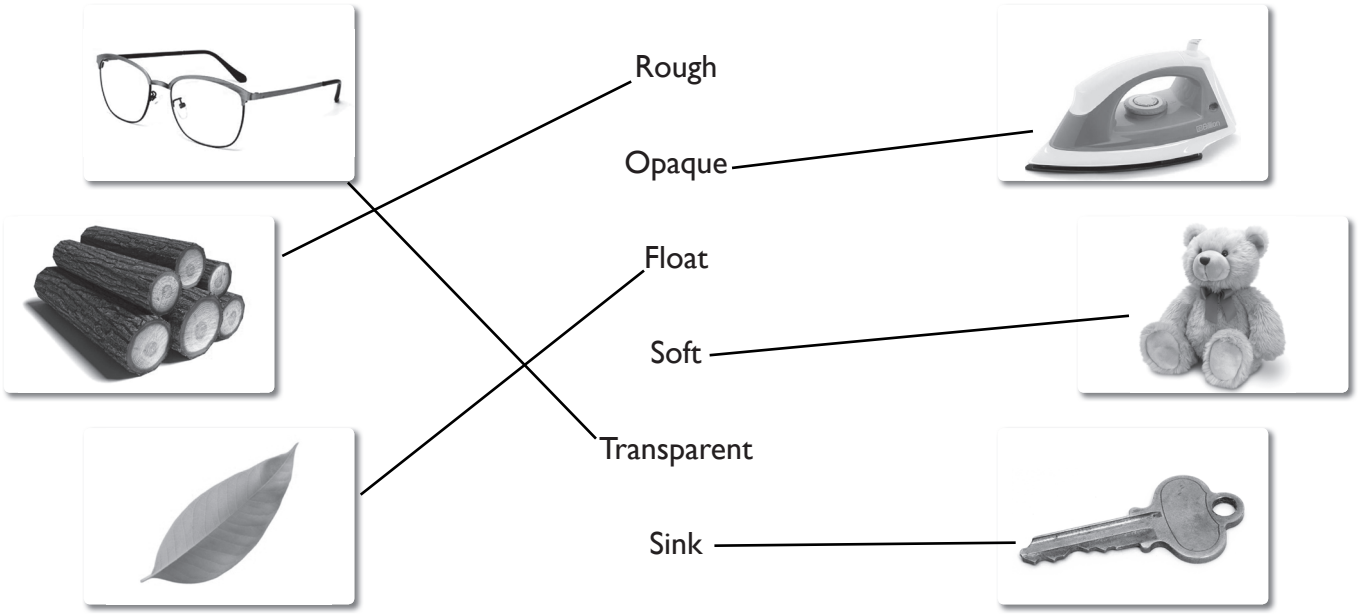
WORKSHEET - 2

1. (a) Paper (b) Kerosene (c) Luster
   (d) Sound (e) Metal key
2. (a) Sorting (b) Translucent (c) Carbon dioxide
   (d) Light (e) Immiscible

3. (a) F (b) F (c) T
   (d) F (e) F (f) F
4. (a) transparent (b) lustrous (c) Water
   (d) Iron, copper (e) Aluminium, cotton (f) Butter paper
   (g) stationery
5. (a) Leaf is lighter and less dense, so floats on water while soap is heavier and dense, hence sinks in water.
   (b) Because gold is a lustrous metal whereas iron is a non-lustrous metal.
6. (a) Immiscibility: When one liquid is added to another, they do not mix with each other. It is called immiscibility.
   (b) Sinking: When a heavy and dense object is put in water, it settles down at the bottom. It is called sinking.
   (c) Lustre: Some materials like gold, have a shine. It is called lustre.

7. (a) (i) (b) (iv) (c) (i)
   (d) (iii) (e) (ii)

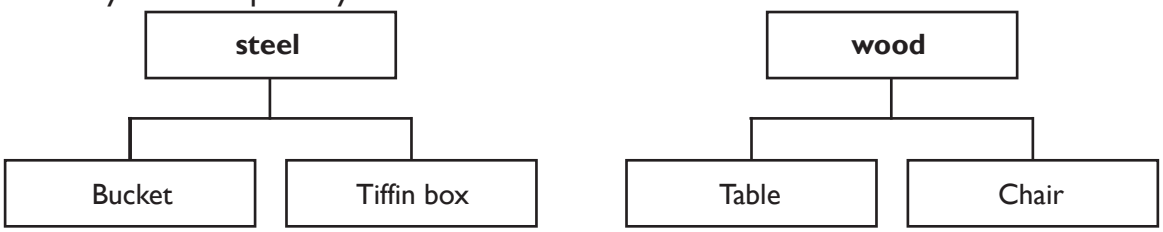
8.



9. (a) SINK (b) SMOOTH (c) OPAQUE
(d) COPPER (e) ROUGH (f) COLOUR
(g) SOFT (h) CLASSIFICATION

10. (a) Solubility and transparency

(b)



(c) Leather can be used for making shoes.

(d) By touching an object, we can classify it as rough or smooth.

(e) Both are solid.

11. (a) Some materials like gold, have shine. It is called lustre. Some materials completely dissolve in a liquid, for example, salt dissolves in water. This property is called solubility.

(b) Because frosted glass is translucent and one cannot see through them.

(c) No, chalk powder is not soluble in water. When we leave mixture of chalk powder and water undisturbed, chalk powder settles down at the bottom.

(d) Materials are either smooth like glass or rough like wall. On appearance basis, they can be either lustrous like gold or non-lustrous like iron.

(e) Mercury is found in liquid state at room temperature and sodium is a soft metal that can be cut with a knife.

12. (a) To make a sugar solution, add a spoonful of sugar to a glass full of water and stir it with a spoon for a few minutes until the sugar disappears. Sugar disappears in water because it is soluble in water and completely dissolves in it.

(b) Objects through which we can see clearly are called transparent objects. Example: glass window pane.

Objects through which we can see only partially and not clearly are called translucent objects. Example: butter paper.

Objects through which we cannot see are called opaque objects. Example: wooden wall.

13. (a) Honey in water is in solution form.

(b) Yes, living things are also classified into different groups. Plants are classified into herbs (wheat, mint), shrubs (Tulsi, lemon), trees (mango, neem), climbers (bitter gourd, grapevine) and creepers (money plant, strawberry). Animals are classified into terrestrial animals (dog, cat), aquatic animals (fish, snail) and aerial animals (parrot, crow).

ACTIVITY ZONE

(a)

Rough	Smooth	Opaque
1. Wood	1. Mirror	1. Book
2. Sandpaper	2. Plate	2. Cloth
3. Brick	3. Glass tumbler	3. Wood

Transparent	Floats	Sinks
1. Air	1. Wood	1. Key
2. Water	2. Leaf	2. Stone
3. Glass	3. Mustard oil	3. Glass

(b) Balloon – Floats
Mirror – Transparent
Feather – Floats
Stone – Sinks
Wall – Opaque
Lemon – Soluble in water
Leaf – Floats
Bark – Rough

Chapter

03 Separation of Substances

WORKSHEET - 1

1. (a) decantation (b) Grain (c) Filter paper
   (d) mixture (e) Sieve

2.

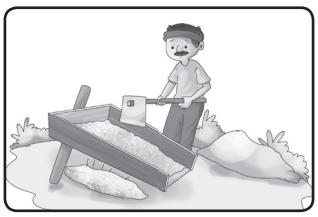
Solution	Solute	Solvent
Tea	Sugar, tea leaves	Water, milk
Lemonade	Lemon, sugar	Water

3. (a) Handpicking (b) Churning (c) Winnowing
   (d) Evaporation (e) Filtration

4. (a) Rice (b) Water
   (c) Wheat flour (d) Husk

5. (a) T (b) F (c) T
   (d) F (e) T

6.



Sieving

Removing pebbles from sand

Winnowing

Removing husk from grains

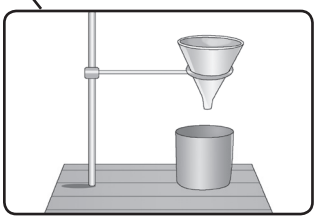
Separation Methods

Threshing

Separating grain from stalks

Handpicking

Removing stones from pulses



Filtration

Removing leaves from tea

7. (a) (i) (b) (iii) (c) (ii)
(d) (i) (e) (iv)

8.

Take the mixture of salt and sand in a beaker.

→ Dissolve the mixture in water.

→ Allow the mixture to stand.

↓ Separate the sand by sedimentation and decantation.

← After decantation, pure salt solution is obtained.

← Boil the salt solution in a beaker for some time.

↓ Collect the water vapour.

→ Salt is left in the beaker.

→ Sand and salt are hence separated from their mixture.

9. (a) Separation is obtaining the components of a mixture.
   (b) Juices are filtered to separate the seeds and solid particles of pulp.
   (c) On cooling, it changes to liquid state.
   (d) A magnet is used to separate iron filings from a heap of mixture.

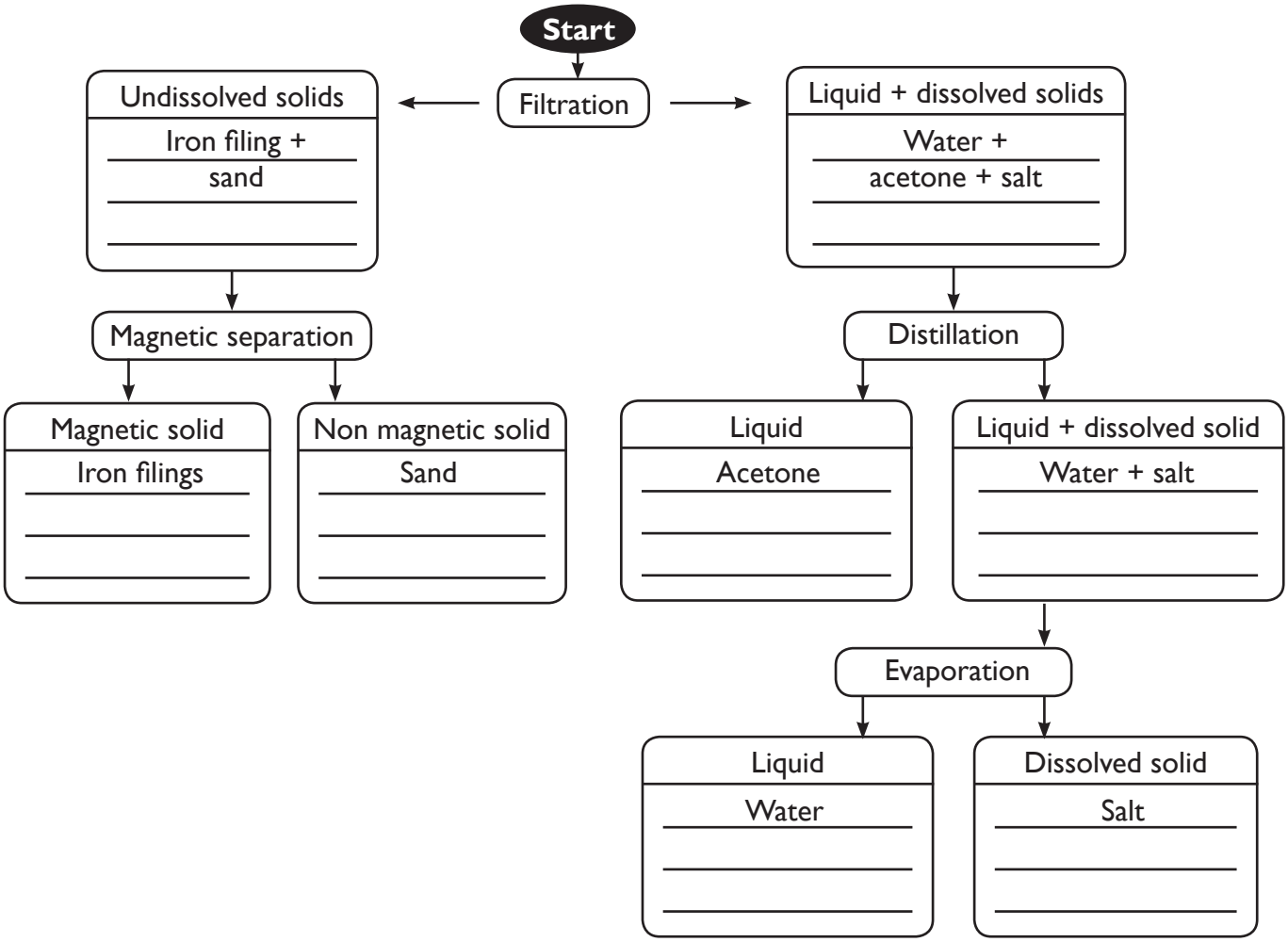
10. (a) Because small stones and grains of pulses are of the same size.
   (b) The solubility of a gas decreases with increasing temperature.
   (c) Sweating and drying of wet clothes in the sun.
   (d) A filter is a paper (or may be a cloth) having very fine pores in it and the filtrate is the liquid obtained after the process of filtration.
   (e) The method of evaporation is used in which sea water is heated by sunlight. It turns into vapour leaving behind solid salt.

11. (a) (i) She will use the winnowing to separate chaff from the grains. In this, blowing air is used to remove the chaff from the grains.
   (ii) She will use handpicking to clean the rice. She will pick small stones from the rice by hands.
   (b) A pure substance consists of a single type of particles while a mixture contains more than one pure substances.
   (c) When the heavier component in a mixture settles after water is added to it, the process is called sedimentation. When the water along with lighter component is removed, it is called decantation.

12. Iron nails are separated from the mixture by using magnets. Then, oil and water are separated by decantation. Oil is lighter so forms the upper layer which we can decant off.

   Now, the mixture contains salt and water. On heating, salt can be obtained from water by the process of evaporation. The water present in the salt solution will form water vapour and then the salt is left behind.

ACTIVITY ZONE



WORKSHEET - 2

1. (a) (iii) (b) (iv) (c) (v)
   (d) (ii) (e) (i)

2. (a) Filtration: It is separating the solids from fluids by a medium having very small pores.
   (b) Churning: When a substance is rotated vigorously, heavier particles settle at the bottom and are hence, separated out.
   (c) Condensation: It is the change of matter from the gas phase into the liquid phase.

3. (a) SOLUTION (b) HANDPICKING (c) FILTRATION
   (d) MIXTURE (e) SATURATED (f) WINNOWING

4. (a) T (b) F (c) F
   (d) F (e) T

5. (a) Sieve (b) Handpicking (c) filtrate
   (d) decantation (e) winnowing (f) sieving

6. (a)

Sedimentation	Filtration
Sedimentation is the settling down of the heavier component in a mixture when water is added to it.	Filtration is separating the solids from fluids by a medium having fine pores like filter paper or strainer, through which only the fluid can pass.

(b)

Residue	Filtrate
Residue is a substance that remains after a process like evaporation.	Filtrate is a liquid that has passed through a medium having fine pores in it, such as filter paper.

(c)

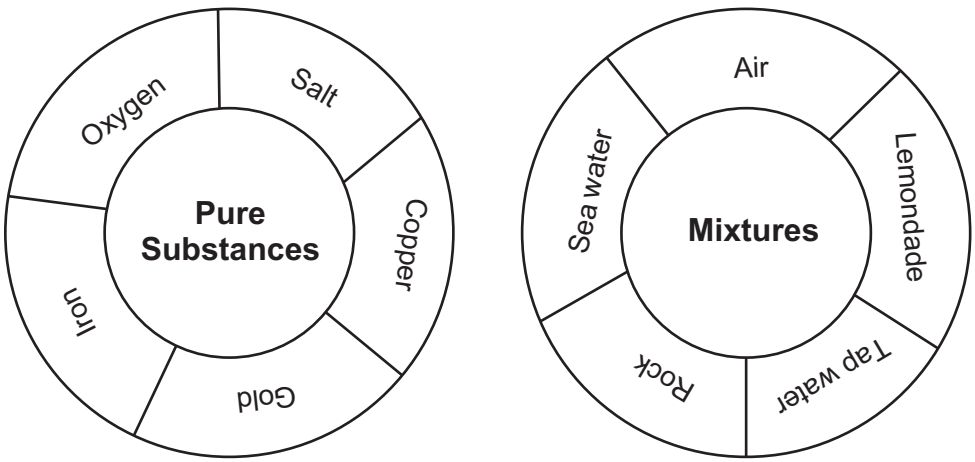
Mixture	Pure substance
A mixture is constituted by more than one kind of pure form of matter. Thus, it contains more than one pure substances.	A pure substance consists of a single type of particles.

(d)

Winnowing	Sieving
Winnowing is the process of separating heavier and lighter components of a mixture by wind or blowing air.	Sieving is allowing the fine particles to pass through the holes of the sieve while the bigger particles remain on the sieve.

7. (a) Evaporation (b) Threshing (c) Sediment
(d) Saturated solution (e) Condensation

8.



9. (a) (i) (b) (ii) (c) (iii)
(d) (ii) (e) (iv) (f) (i)

10. (a) Yes, by sieving with relavant size of pores in the sieve.
(b) Evaporation
(c) On increasing temperature, the solubility increases.
(d) Sieving is based on different sizes of various particles.
(e) Sedimentation and decantation.

11. (a) A strainer is a device having very smell pores in it. It is used for separating leaves from the tea. It is used for filtration method.

(b) We use sieving to separate the impurities from flour before making dough.

(c) One method of separation is not enough because method of separation depends upon the type of substances which are to be separated. Since there are a variety of substances, there are a variety of methods also.

(d) Winnowing is the process of separating heavier and lighter components of a mixture by wind or blowing air.

12. (a) (i) By stirring well, the salt will dissolve in water completely. Now chalk powder can be separated by filtration. To separate the salt from water, we can heat the solution and use the evaporation method.

(ii) A mixture of sugar and sawdust in water can be separated by the same method.

(b) Yes, it is possible. The mixture is allowed to pass through a sieve. The wheat flour particles will pass through it while sugar particles will not.

(c) By threshing, the grains can be separated from stalk. In this, the stalks are beaten to free the grain seeds.

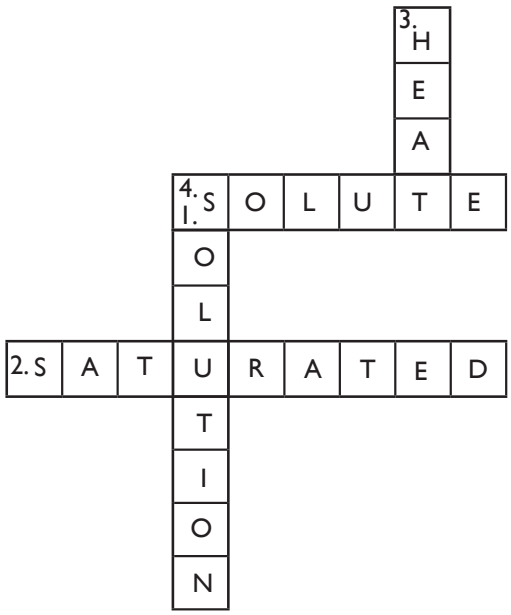
13. A – Supernatant: The liquid lying above a solid residue in the pot.

B – Sediment: The solid settled at the bottom of the pot.

ACTIVITY ZONE

(a) (i) and (v) are to filter things. (i) is to filter the microbes and preventing them from reaching our month while (v) is to filter mosquitoes and preventing them from entering our house.

(b)



Chapter

04 Getting to Know Plants

WORKSHEET - 1

1. (a) leaf
   (b) leaves
   (c) Root
   (d) root system
   (e) internode

2.

Type of plant	Stem size	Stem colour	Stem structure	Stem strength	Branching place	Examples
Herb	Small	Green	Thin and tender	Weak	Part above ground	Coriander
Shrub	Medium	Brown	Woody, hard not very thick	Strong	Near the base	Rose
Tree	Long	Brown	Thick and hard	Strong	Part above ground	Neem

3.

Neem

Pipal

Banana

Rose

Money plant

4. (a) F (b) T (c) T
   (d) F (e) T

5. (a) Flower (b) Stamen (c) Pistil
(d) Pollination (e) Seed coat

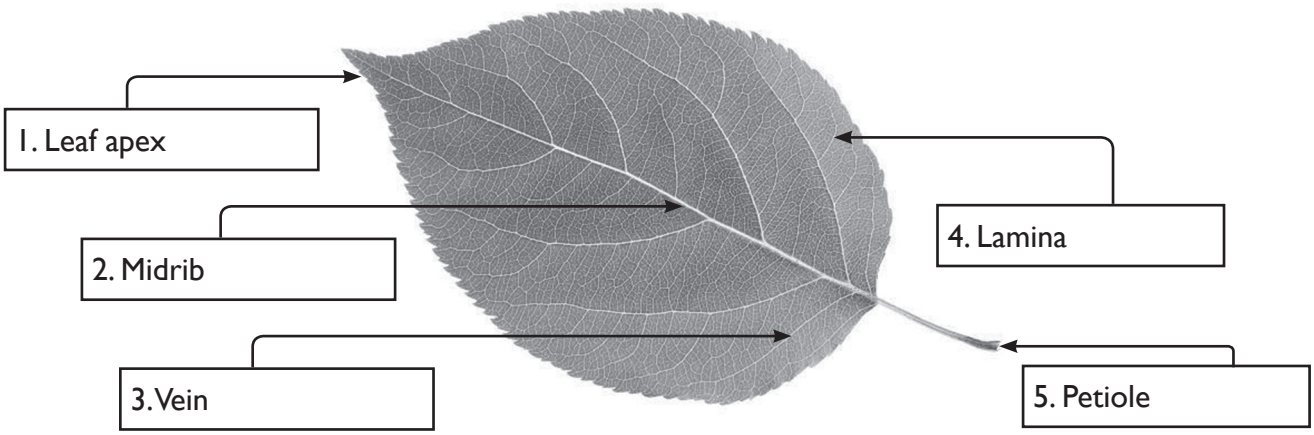
6. (a) (iv) (b) (i) (c) (vi)
(d) (ii) (e) (iii) (f) (v)

7.

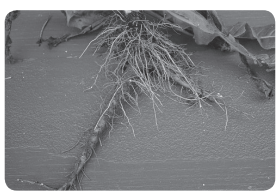
Herbs	Shrubs	Trees	Climbers	Creepers
Wheat, banana	Lemon	Banyan	Money plant	Bottle gourd
Maize, papaya	Bougainvillea	Mango		
Potato, tomato, grass		Guava		
Coriander, sugar cane, basil	Chilli, groundnut			

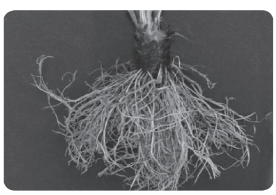
8. (a) (iv) (b) (ii) (c) (iv)
(d) (iv) (e) (ii)

9.



10.

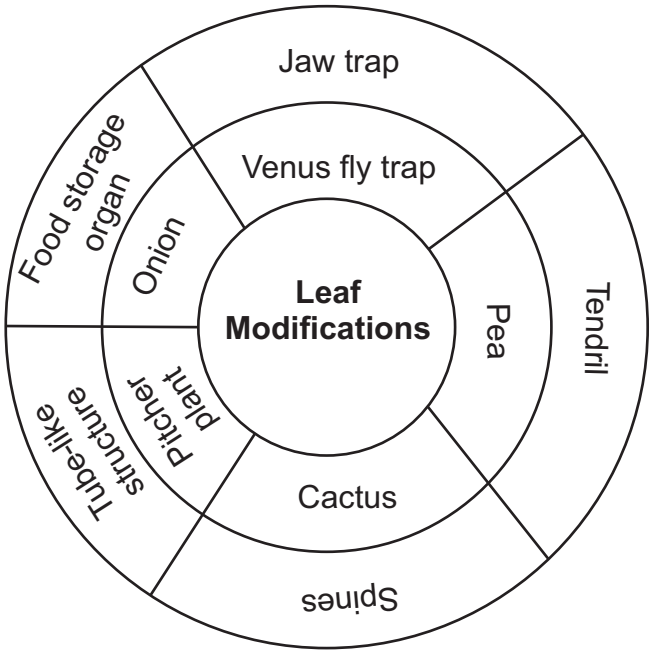

Tap root


Fibrous root


Adventitious root


Prop root

11.



12. (a) Ovules are present in ovary.
    (b) Parallel venation
    (c) Petiole
    (d) Creepers

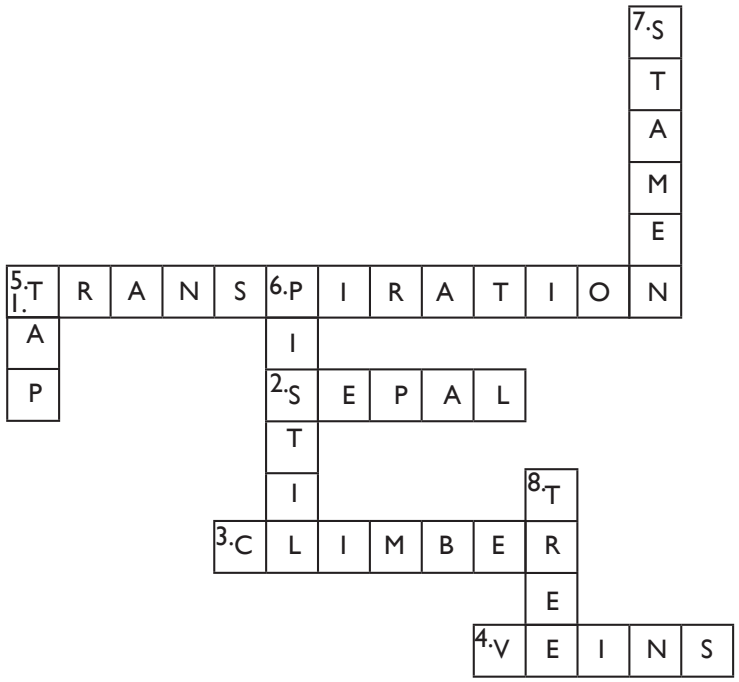
13. (a) The transfer of pollen grains from the anther of one flower to stigma of another or same flower is called pollination. Birds and insects are agents.
    (b) Leaves of plants prepare their food in the presence of sunlight and a green coloured substance called chlorophyll. This process is called photosynthesis. Water and carbon dioxide are also required by plants.
    (c) Plants with weak stems that cannot stand upright but spread on the ground are called creepers, e.g., pumpkin, while those that take support and climb are called climbers, e.g., bottle gourd.
    (d) In a leaf, if the design made by the veins is net-like on both sides of midrib, it is reticulate. If veins are parallel to one another, it is parallel venation.
    (e) Leaves prepare their food by the process of photosynthesis. These release a lot of water into atmosphere through transpiration.
    (f) (i) Stem spreads out branches bearing leaves, flowers and fruits.
        (ii) It conducts water, minerals and food.
        (iii) Some stems perform the function of food storage, support and protection.

14. (a) Water comes out of leaves in the form of vapour by a process. It is called transpiration. It cools down the plant and pumps water and minerals to the leaves for photosynthesis.
    (b) After pollination, pollen grains transfer male gametes to ovule which unite with female gametes and fertilisation takes place.
    (c) (i) Stamen
        (ii) Pollen grains
        (iii) Anthers
    (d) A flower has four basic parts – the petals, the sepals, the carpel and the stamen. The main parts of a flower that are important for its function are male part, stamen and female part, pistil. Pistil consists

of stigma, style and ovary. Stamen consists of filament and anther. Pollen grains are produced in anther.

15. The image shows that the stem of a flower is split into two parts and dipped into two beakers that contain two different coloured solutions. After some time, the colour of half flower changes same as the colour of solution in one beaker while the other half of flower takes the colour of solution in other beaker. We can infer from this activity that stem conducts water and other minerals from the soil to other parts of the plant.

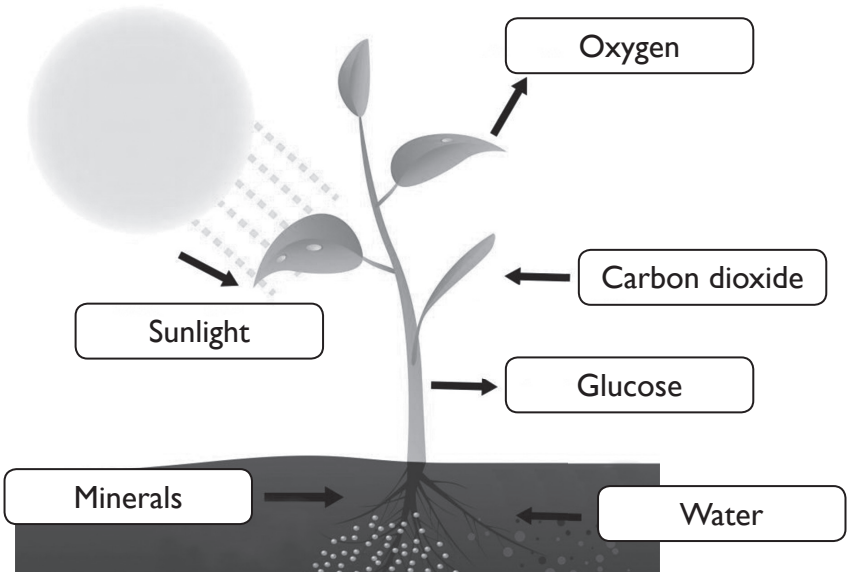
ACTIVITY ZONE



WORKSHEET - 2

1. (a) (iii) (b) (i) (c) (ii)
   (d) (iii) (e) (ii) (f) (ii)
2. (a) two (b) weeds (c) Stem
   (d) green (e) parallel

3.



4. (a) (iv) (b) (i) (c) (v)
(d) (ii) (e) (iii)

5.

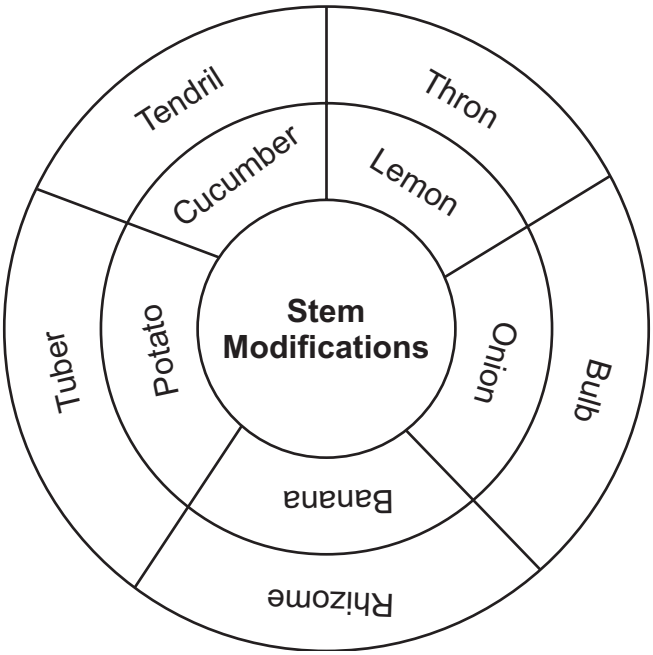



Venation:	Reticulate	Parallel	Reticulate	Parallel
Root:	Tap root	Fibrous root	Tap root	Fibrous root

6.

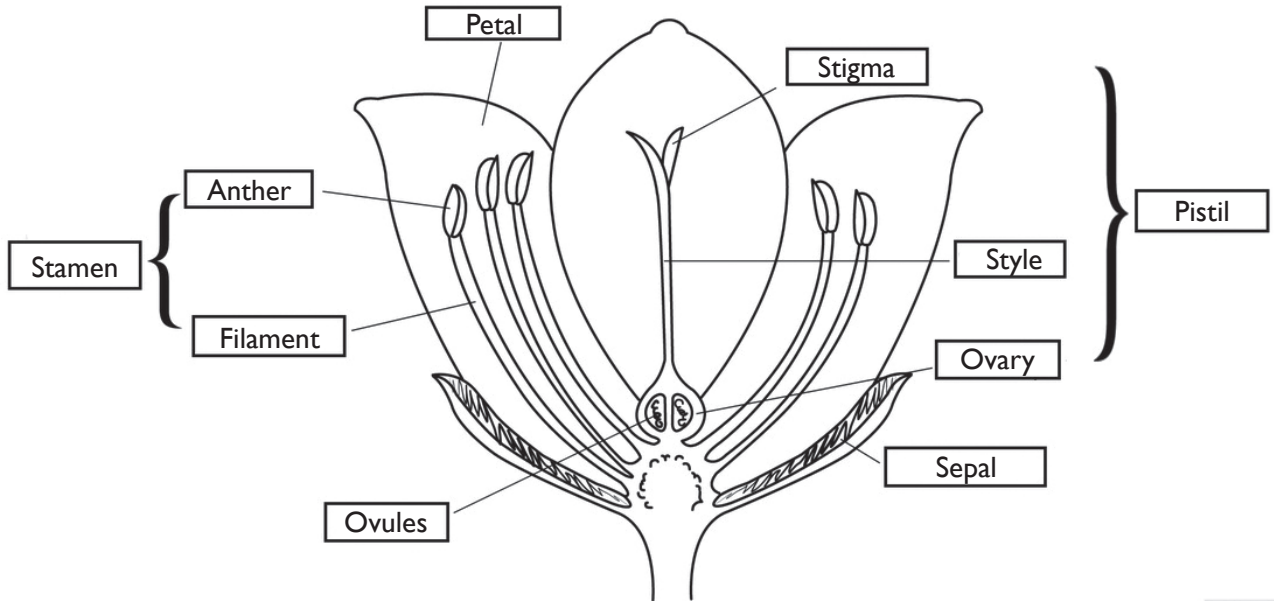
a.	Roots that we eat	Carrot	Radish
b.	Stems that we eat	Potato	Ginger
c.	Flowers that we eat	Cauliflower	Broccoli
d.	Any flowers	Sunflower	Rose
e.	Seeds that sprout	Gram	Lentils

7.

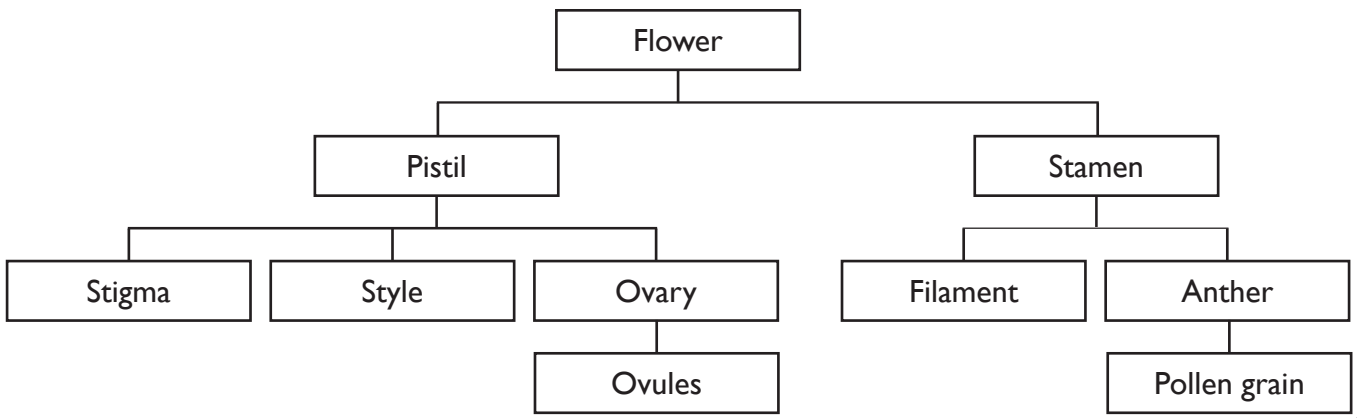


8. (a) Fibrous (b) Venation (c) Shrubs
(d) Edible (e) Sepals

9.



10.



11. (a) Style connects stigma to ovary.
(b) These are called ovules.
(c) Flowers, leaves, buds, branches and fruits are present on the stem.

12. (a) Root that has one main root and other lateral roots is called a tap root, e.g. carrot, beet. Root containing all similar roots and no main root is fibrous root, e.g., wheat, banana.

(b) Petiole is the stalk which attaches leaf blade to the stem while lamina is the extended portion or blade of a leaf specialised for photosynthesis.

(c) In weak-stemmed plants, leaves are modified into tendrils which help in climbing around the support. For example, pea.

(d) Petals attract pollinators like bees, butterflies whereas sepals protect the developing flower and keep it from drying out.

(e) Herbs are short plants with green and tender stems, for example, tomato, chilli. Shrubs are bigger than herbs having a hard stem, for example, lemon, henna.

(f) Weeds are unwanted plants that grow with crops. Farmers remove weeds since they compete for soil, nutrients and water with main crop.

13. (a) (i) The process of transpiration is demonstrated in this activity which shows that plants release water into air.
(ii) This activity will show better result on a bright sunny day.
(iii) We see droplets of water in the polythene bag.
(iv) Ensure that it is a sunny day while performing activity. Make sure you have taken a healthy, well watered plant.

(b) Immerse a leaf in alcohol in a test tube, place test tube in a beaker half filled with water and heat the beaker. Now take out leaf, wash it in water and pour iodine solution over it. Leaf changes blue black coloured showing starch has in it.

(c) Respiration is exchange of gases in living things. Animals take in oxygen and release carbon dioxide while plants take in carbon dioxide and release oxygen. Yes, all plants respire. We should not sleep under trees at night because they release carbon dioxide at night.

14. Photosynthesis occurs when a tree uses sunlight and chlorophyll to convert carbon dioxide and water into glucose. Sunlight energy is converted into chemical energy by using chlorophyll.

ACTIVITY ZONE

A	Y	V	X	T	R	A	N	S	P	I	R	A	T	I	O	N
T	M	E	O	R	L	I	T	S	K	N	K	P	J	S	G	S
C	L	I	M	B	E	R	S	F	T	I	L	M	G	E	K	T
R	A	N	C	L	I	K	H	E	R	B	Q	Z	V	P	W	X
E	M	S	U	I	D	E	R	E	T	I	C	U	L	A	T	E
E	I	F	I	B	R	O	U	S	R	O	O	T	G	L	H	I
P	N	F	Q	R	M	T	B	M	F	P	T	I	N	L	K	F
E	A	O	K	S	P	I	S	T	I	L	G	H	P	G	S	T
R	L	M	R	K	T	S	L	A	U	L	M	T	R	E	E	F
S	T	A	M	E	N	N	T	P	E	T	A	L	P	Z	P	K

TRANSPIRATION, CLIMBERS, RETICULATE, FIBROUS ROOT, PISTIL, STAMEN, PETAL, CREEPERS, LAMINA, AIR, SEPAL

05 Body Movements

WORKSHEET - 1

1. (a) joint (b) 33 (c) 206
   (d) 300 (e) Snail (f) streamlined

2.

Ball and Socket joint	Hinge joint	Pivotal joint	Gliding joint	Fixed joint
Shoulder	Toes, Knee	Neck	Wrist	Head
Pelvic girdle	Fingers, Arm		Ankle	Backbone
	Elbow			

3. (a) Skeleton (b) Joint (c) Fixed
   (d) Pelvic region (e) Brain

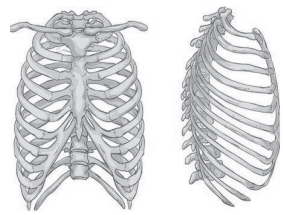
4.

a.	Body parts having hinge joint	Toes	Fingers
b.	Body parts having ball and socket joint	Shoulder	Hip
c.	Animals having exo-skeleton	Snail	Tortoise
d.	Organs protected by ribs	Heart	Lungs
e.	Body parts having fixed joints	Skull	Backbone

5.

Hand

Hinge joint



Ribcage

Fixed joint

Backbone

Fixed joint

Skull

Fixed joint

Shoulder

Ball and socket joint

Arm

Hinge joint

6.

S. No.	Body part	Type of joint	Description of the movement
1.	Knee	Hinge	Back and forth movement
2.	Shoulder	Ball and socket	Movement in all directions
3.	Hip	Ball and socket	Movement in all directions
4.	Wrist	Gliding	Sliding or gliding movement
5.	Neck	Pivotal	Right and left movement
6.	Elbow	Hinge	Back and forth movement
7.	Skull	Fixed	No movement

7. (a) (i) (b) (ii) (c) (ii)
(d) (iii) (e) (iv)

8. (a) Bristles help the earthworm to move.
(b) Lower tentacles
(c) Hinge joint
(d) No, all the ribs are not connected to the chest bone in front.

9. (a) Tendons are inelastic connective tissues which connect muscles to bones. Ligaments are elastic connective tissues which connect bone to bone.
(b) Because they are attached only to the vertebrae and not to the sternum.
(c) Skeletal system supports the body, facilitates movement and protects the internal organs.
(d) Snakes use their muscles and scales to move. Snakes push off the surface to get going. They move in a wavy motion.
(e) Arthritis affects smooth cartilage lining of joints. This makes movement more difficult than usual leading to pain and stiffness.

10. (a) Muscles can pull on bones, but they cannot push them back to their original position, so they work in pairs. Muscles get their signals to contract and relax from the brain.
(b) Swim bladder contributes to the ability of water animals to control their buoyancy and thus to stay at their current water depth without wasting energy in swimming.

11. (a) Under the body of an earthworm, there are a large number of tiny bristles project out. These bristles are connected with muscles. These bristles help to get a good grip on the ground which an earthworm moves. Thus, they help in movement.

(b) In that case, our nose will not be able to absorb shock or reduce friction. The damage can cause excessive bleeding and pain. Once it is fractured, it will be prone to fracture again.

ACTIVITY ZONE

(a)

Legs

Winges

Limbs

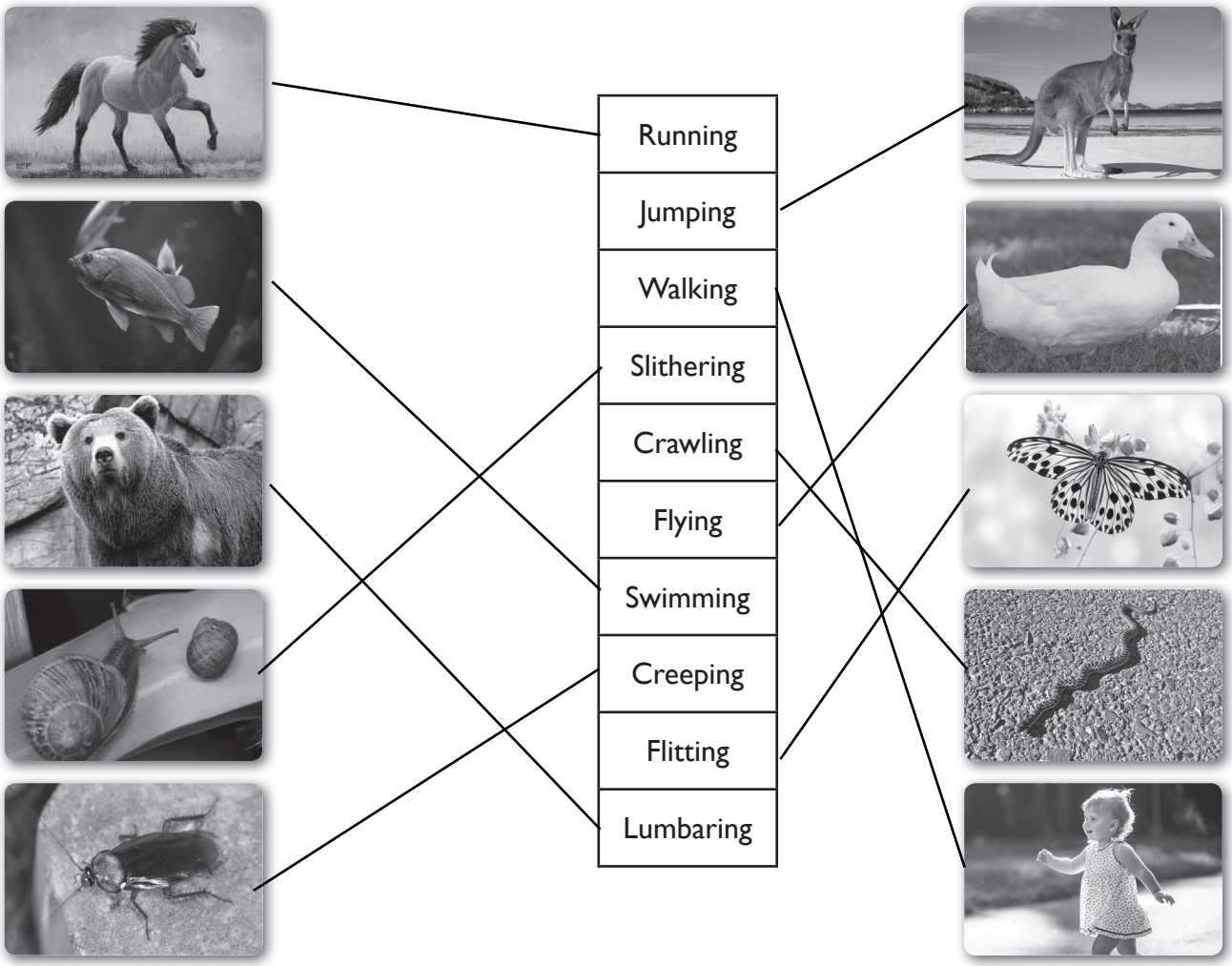
Whole body

(b) (i) circulatory (ii) digestive (iii) skeletal
(iv) nervous (v) respiratory

WORKSHEET - 2

1. (a) (v) (b) (iv) (c) (i)
   (d) (ii) (e) (vi) (f) (iii)
2. (a) (iii) (b) (i) (c) (iii)
   (d) (i) (e) (ii)
3. (a) Mimosa – They show movement of leaves on touching. Leave fold up when touched.
   (b) Sunflower – They show movement of flowers towards the sun.
4. (a) T (b) T (c) F
   (d) T (e) T
5. (a) Backbone (b) Skull (c) Frog
   (d) Heart (e) Ribs

6.



7. (a) Muscles
   (b) Ball and socket joint
   (c) Motion
   (d) Caudal fin
   (e) Cartilage
   (f) Femur
8. (a) cranium
   (b) 33
   (c) fixed
   (d) Brain
   (e) breast bone
9. (a) Muscles
   (b) Mandible or the jaw bone
   (c) A hinge joint
   (d) Stapes in the middle ear
   (e) Tricep muscles relax.

10. (a) Over time, most of the cartilage turns into bone. The process is called ossification. As the baby grows, some of its bones fuse together to form bigger bones.

(b) Because the knee joint called patellofemoral joint does not allow the knee to move forward.

(c) Cartilage provides support. It allows for some flexibility of movement but has more stability than muscles.

(d) (i) Snail: It moves with the help of muscular foot. It produces wave-like motion along its foot, contracting and stretching its muscles, which pushes its body against the surface.

(ii) Cockroach: A cockroach moves its legs with the help of muscles near the limbs. Thus, it moves.

(e) Streamlined shape helps in orientation of the movement in a particular path. It also helps in experiencing less friction with the medium.

(f) Earthworms increase the amount of air and water in soil. They break down organic matter like leaves and grass into things that plants can use. When they eat, they leave behind castings that are a very valuable type of fertiliser.

11. (a) The skeletal system is the body system composed of bones, cartilages, ligaments and other tissues that perform essential, functions for the body.

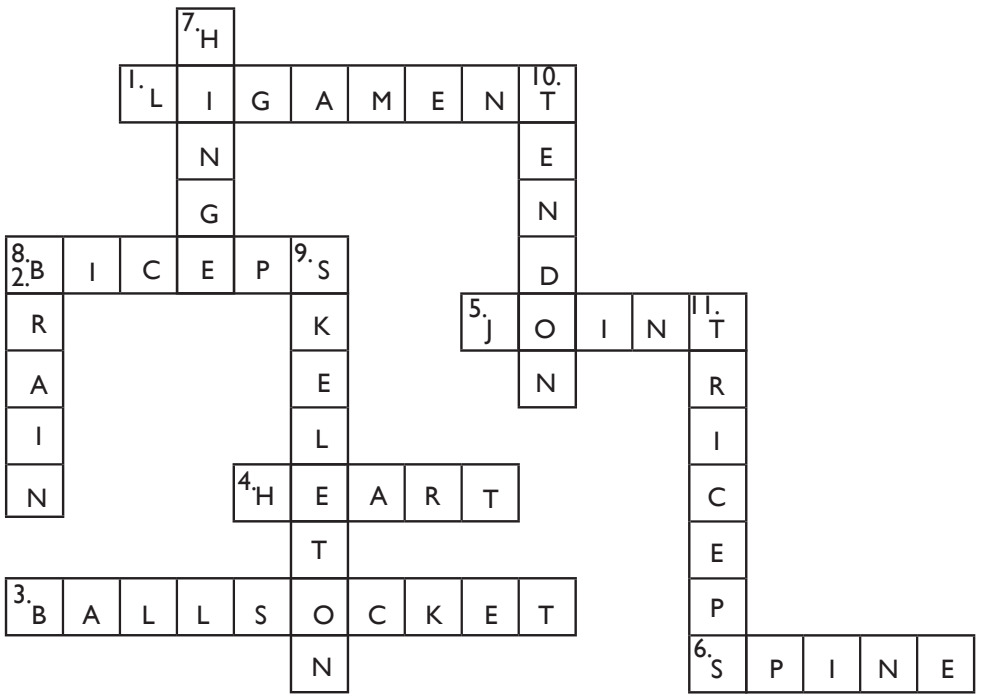
No, all animals do not have bones. Animals with backbone are called vertebrates, for example, dog, cat, lion, wolf, etc. On the other hand, animals without backbones are called invertebrates, for example, earthworm, insects, starfish, snail, octopus, etc.

(b) Hinge joint is present in elbow. It allows only a back and forth movement.

12. (a) In that case, we would not be able to sit, crouch or lie. One single bone means no flexibility in the structure of a bone.

(b) Snake in picture B will move faster. It is because its body curves into many loops. Each loop gives it a forward push by pressing against the ground.

ACTIVITY ZONE



06 The living Organisms – Characteristics and Habitats

WORKSHEET - 1

1. (a) (i) (b) (iv) (c) (ii)

   (d) (iii) (e) (ii)

2. (a) The surroundings where organisms live is called habitat.

   (b) The presence of specific features or certain habits, which enable a plant or an animal to live in its surroundings is called adaptation.

3. 

   Grassland

   Forest

   Forest

   Polar region

   Grassland

4. (a) (iv) (b) (v) (c) (i)

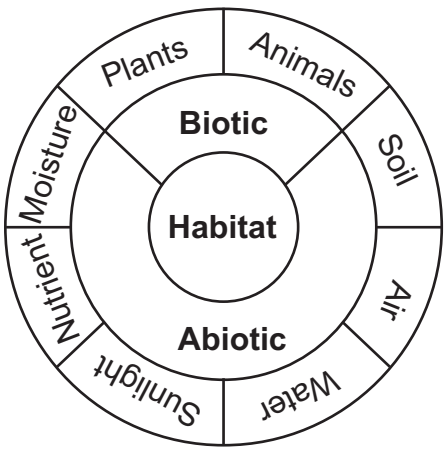
   (d) (iii)

5.

Habitats	Biotic components		Abiotic Components
	Plants	Animals	
Mountain	Pine	Big horn sheep	Soil, air, water, light
Desert	Desert lily	Fennec fox	Soil, air, water, light
Grassland	Oat	Wolf	Soil, air, water, light
Forest	Cedar	Bear	Soil, air, water, light

6. (a) grasslands (b) hibernation (c) thick hair
(d) waxy (e) broad

7.



8. (a) Conical (b) Habitat (c) Subcutaneous fat
(d) Hump (e) Camouflage

9. (a) Stem
(b) Long legs keep their body away from hot sand of deserts and help them move fast.
(c) To keep out mid day heat and to recycle moisture from their own breath.
(d) Lantern fly and green caterpillar (Tanaecia species).

10. (a) Terrestrial animals can be found in the land, e.g., dog, cat, etc., while aquatic animals can be found in water habitats, e.g., fish, snail.
(b) Thick fleshy leaves with a waxy coating and spines.
(c) Migration is the temporary movement of species from one place to another for better living conditions. Siberian crane and arctic tern are two migratory birds.
(d) To reduce the loss of water by transpiration, the leaves are smaller in size in maintain trees. Pine and fir are two trees that grow on mountains.
(e) Lotus plants have air-filled passages in the spongy plant tissue found in leaves, stems and roots. This allows oxygen from atmosphere to travel down to roots.
(f) It is the process in which an individual organism adjusts to a change in its environment, allowing to maintain performance across a range of environmental conditions. Example: Sheep grow very thick wool in damp, cold climates.

11. (a) (i) Polar bear
(ii) Polar region
(iii) A polar bear has a layer of fat under its skin which helps it stay warm. It also has a thick layer of fur.
(b) (i) A deer has long ears to hear movements of predators. The eyes on the side of its head allow it to look in all directions for danger. The speed of the deer helps it to run away from the predators.
(ii) In lions, a tawny coat assists them when stalking prey in grass.
(iii) Fish have gills to breathe in water. They have fins and tail that help them change direction and keep their body balance in water. They have streamlined shape that helps them swim in water.

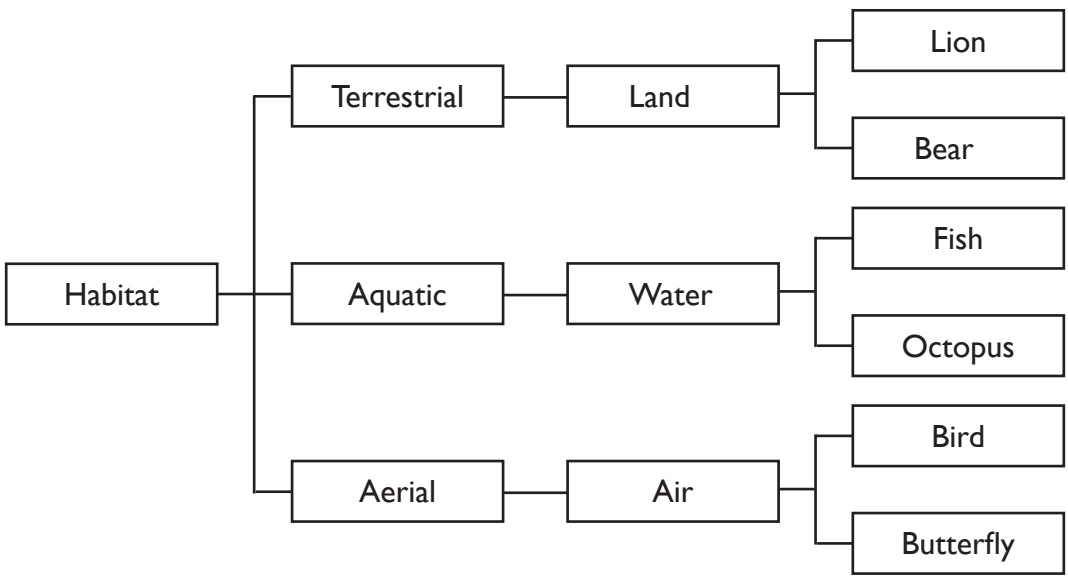
12. Animals such as an arctic fox hide themselves against a background of the same colour to protect themselves from predators.

ACTIVITY ZONE

A	D	A	P	T	A	T	I	O	N
L	Z	D	E	S	E	R	T	L	I
M	O	U	N	T	A	I	N	K	L
N	A	Q	U	A	T	I	C	R	M
O	X	M	I	G	R	A	T	E	A
Y	M	I	N	B	E	A	R	Y	C

WORKSHEET - 2

1.



2. (a) webbed (b) oxygen (c) excretion
(d) stem (e) Gills (f) pond

3.

Living things	Non-living things
Sloth bear	Cloth
Plant	Chair
Fish	Rice
Crocodile	Hair
Bajra seeds	Litchi

6. (a) (v) (b) (iv) (c) (i)
(d) (vi) (e) (iii) (f) (ii)

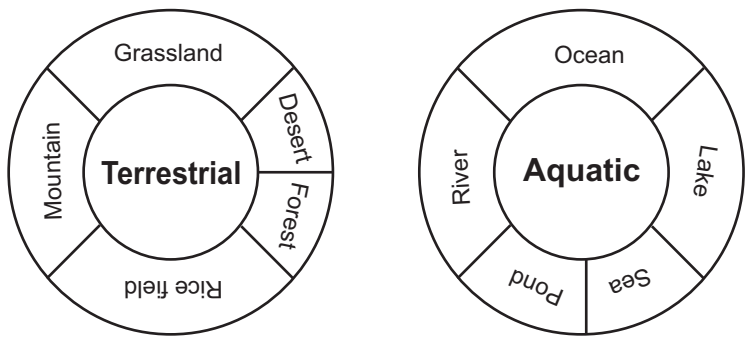
5. (a) So that it can camouflage into its snowy environment.
(b) To prevent water loss by reducing air flow close to the cactus.
(c) Eyes on the sides of head allow it to look in all directions for danger.
(d) So that they can easily bend with flowing water. This provides least resistance to the flow of water.

6.

(a)	Two terrestrial habitats	Grassland	Forest
(b)	Two aquatic habitats	Pond	Sea
(c)	Two aquatic plants	Lotus	Water lily
(d)	Two animals of mountain region	Big horn sheep	Brown bear

7. (a) (ii) (b) (iii) (c) (i)
(d) (i) (e) (ii)

8.



9. (a) Its long legs help it to keep its body away from hot sand. Its hump acts as a food reserve filled with fat.
   (b) Waxy layer helps desert plants to retain water.
   (c) Scales protect the fish and also help in easy movement through water. Gills help them to use oxygen dissolved in water.
   (d) The mountain goats have strong hooves for running up the rocky slopes of the mountains.
   (e) The lion's brown skin assists it when stalking prey in grass.

10. (a) Deserts are large dry barren regions, usually having sandy or rocky soil and little or no vegetation. While polar regions have chilled weather because they contain ice caps.
   (b) A stimulus is anything that may have an impact or influence on a system and a response is the behaviour that is manifested by an organism which is the result of a stimulus.
   (c) Hibernation is a deep sleep that helps the animals to save energy and survive the winter without eating much. Bat, bear and chipmunk undergo hibernation.
   (d) Every living organism begins life as a single cell. Unicellular organisms, e.g., amoeba, may stay as one cell but they grow too. Multicellular organisms, e.g., humans, add more and more cells to form tissues and organs as they grow.

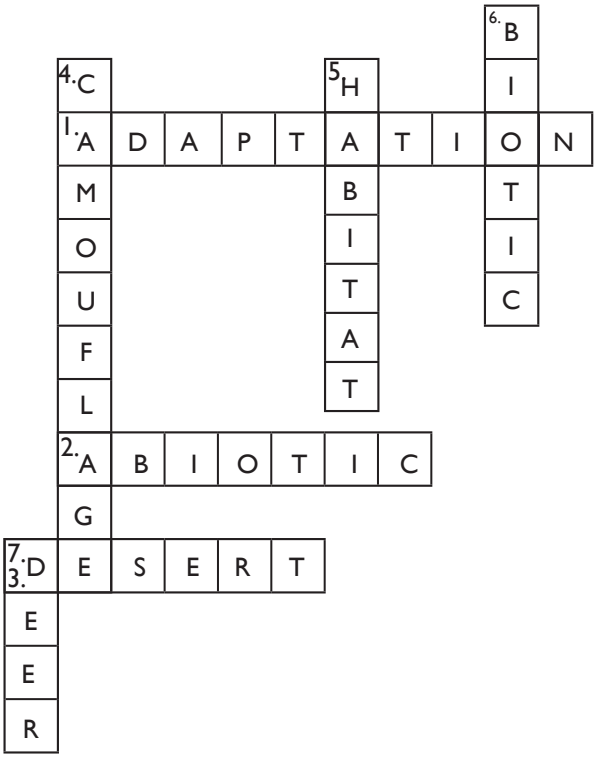
11. (a) The presence of specific features and habits, which enable a plant or an animal to live in a particular habitat is called adaptation. It is necessary for an organism to survive in area or climate it lives in. Those animals who do not adapt to the environment are not able to survive and die out.
   (b) Desert plants are adapted to cope with the dry and hot climate while trees on mountains are well adapted to cool climate and heavy downpours. Leaves in desert plants are reduced to spines and photosynthesis usually occurs in stems while trees on mountains have needle-like leaves and photosynthesis occurs in them. Stems and leaves in desert plants have thick waxy coating (cuticle) but trees on mountains have narrow leaves without waxy coating.

   Savanna and steppe have almost similar kind of environment.
   (c) No, biotic and abiotic components of the habitat are dependent on each other. For example, plants need sunlight, water and CO_2 for carrying out photosynthesis that produces food which feed other organisms. Likewise, organisms after death, provide nutrients to the soil and energy to the environment.

12. (a) (i) Camels can drink up to 32 gallons (46 litres) of water in one drinking session. Thus, they can go one week or more without water.
   (ii) Camel can close nostrils. It prevents the sand entering nose.
   (iii) Camels have wide feet so they can walk on sand easily.
   (iv) Camels have thick lips so they can eat prickly desert plants without feeling pain.
   (v) Long legs keep a camel's body away from the heat of desert sand.
   (b) Dolphins cannot breathe underwater. They come to the surface of water to take in air through a blowhole situated on their head. Though they are able to hold their breath for 8–10 minutes underwater.

ACTIVITY ZONE

(a)



(b) i) HABITAT

ii) SUCCULENT

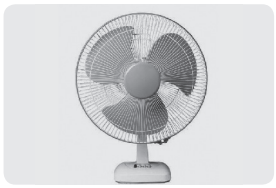
iii) HYDROPHYTE

iv) XEROPHYTES

07 Motion and Measurement of Distances

WORKSHEET - 1

1.



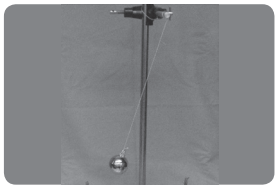
Circular

Periodic

Curvilinear

Rectilinear

Circular



Periodic

2. (a) (i) (b) (ii) (c) (iii)
   (d) (i) (e) (iv)
3. (a) rest (b) rectilinear (c) Standard
   (d) more than one (e) periodic

4.

Initially, people moved on their foot and carry goods on their back.

They began to use animals for transportation. For transport through water routes, boats were used from ancient times.

Earliest boats were simple logs of wood, in which a hollow cavity could be made.

Invention of the wheel made a great change in modes of transport.

Invention of steam engine led to the development of new means of transport.

Automobiles and motorised boats/ships were used as means of transport on land and water respectively.

In 1900 development of aeroplanes took place. These were later improved to carry passengers and goods.

Electric trains, monorail, supersonic aeroplanes and spacecraft were developed in 20th century.

5.


Length


Weight


Temperature


Time

Length

6. (a) (iv) (b) (v) (c) (i)
(d) (vi) (e) (ii) (f) (iii)

7.

S.No.	Motion	Example 1	Example 2
1.	Periodic motion	Motion of hands of a clock	Motion of earth around the sun
2.	Circular motion	A spinning top	A rotating fan
3.	Rotatory motion	Motion of blades of fan	Motion of a potter's wheel
4.	Rectilinear	March-past of soliders in parade	Vehicle running on a straight road

8. (a) Metre and kilometre
(b) These are uniform units in which measurement of any quantity like length, mass, etc., are measured and expressed.
(c) Millimetre
(d) Kilometre

9. (a) In circular motion, an object moves such that its distance from a fixed point remains the same. A spinning top and a rotating fan are examples of circular motion.
(b) In this case, the reading should be started from 2 cm mark to measure the length of the book.
(c) Motion of a ceiling fan is an example of circular motion while motion of a pendulum is the example of periodic motion.
(d) Standard units are used for the sake of uniformity. These units are uniform all over the world.
(e) Periodic motion repeats itself after fixed interval of time, e.g., earth moving around the sun. On the other hand, non-periodic motion does not repeat itself after fixed interval of time, e.g., a footboller running on a field.

10. (a) (i) Handspan and cubit cannot be used as a reliable unit of measurement because they are not of the same length in all people. Different people have different sizes of handspan and cubit.
(ii) We cannot measure all lengths in one standard unit of length because some lengths are very big like distance between two cities, while some others are very small like the thickness of a coin.

(b) (i) It is rotatory motion.

(ii) It is circular motion.

(c) (i) Only very fast to and fro movements are the vibrations like plucking of guitar string. Otherwise if they are slow they are oscillations like motion of pendulum.

(ii) Because sometimes rate of hearbeat per minute gets a changed depending on the emotions and feelings of the person.

11. Invention of wheel made a great change in modes of transport. With this invention, vehicles were designed with wheels to be pulled by animals. The design of wheel was improved over thousands of years. Later on steam engine and other vehicles were invented which used wheels.

ACTIVITY ZONE

X	S	K	M	L	L	F	R	I	M	Z
L	E	U	M	E	T	R	E	R	O	D
E	C	F	O	N	A	U	S	U	U	R
F	O	O	T	G	P	L	T	O	I	I
A	N	O	I	T	E	E	E	H	E	R
C	D	T	O	H	G	R	P	Z	K	M
S	I	U	N	I	T	H	R	E	A	D

WORKSHEET - 2

1. (a) (iii) (b) (iii) (c) (iii)
(d) (i) (e) (iv)

2. (a) 5.1 (b) 7.0
(c) 2.8 (d) 5.8

3.

S. No.	To be measured	Device
1.	Size of your wrist	Measuring tape
2.	Your weight	Weighing machine
3.	Circumference of a round table	Measuring tape
4.	Cloth required for a curtain	Meter scale

4. (a) T (b) T (c) F
(d) F (e) F

5. (a) circular (b) straight (c) 5000 m
(d) unit (e) rotatory

6. (c)

7.

S. No.	Measurement	Convenient Unit
1.	Distance between Delhi and Jaipur	Kilometre
2.	Length of a pencil	Centimetre
3.	Length of a room	Metre
4.	Length of a table	Metre
5.	Height of a person	Metre
6.	Distance between India and Indonesia	Kilometre
7.	Thickness of a coin	Millimetre

8.

(a)	1 km	1000 m	1,00,000 cm	10,00,000 mm
(b)	0.6 km	600 m	60,000 cm	6,00,000 m
(c)	12.5 days	300 hours	18,000 min	10,80,000 s
(d)	50 kg	50,000 g	50,00,000 cg	5,00,00,000 mg

9. (a) They are at rest with respect to each other.
   (b) A ball rolling and moving forward on the ground.
   (c) 250 centimetre
   (d) By using meter scale.

10. (a) Cloth merchants use iron/steel metre scale. Tailors use plastic metre scale tape. Carpenters use plastic metre tape and iron metre scale both.
    (b) Rotation – Earth rotates on its axis. Revolution – Earth revolves around the sun.
    (c) Length of the block = 15.50 – 10.00 = 5.50 cm
    The reason may be that either scale is broken or the marking is not clearly visible up to the 9 cm mark.
    (d) Yes, it is possible. For example, a passenger sitting in moving bus is in rest with respect to his fellow passengers as his position is not changing with respect to other passengers. But he is in motion with respect to a person on the road side since the passenger's position is changing with respect to that person.
    (e) A body moving to and fro very fast about its mean position is said to be in vibratory motion, e.g., plucking the string of a guitar, whereas the motion in which a body moves along a circular path about a fixed point or axis without changing its position is called rotational motion, e.g., motion of a potter's wheel.

11. (a) The scales of measurement may not be standard. These may be some errors in scales they were using. They may not be using the correct method of observing the scale. The length of the scale may not be proper.

(b) (i) Rectilinear motion: The handle of bicycle will always move in rectilinear path since it cannot execute circular or rotatory motion.

(ii) Circular motion: The pedals of bicycle will always move circularly around its chain fixing system, because they cannot move in forward direction.

(iii) Both circular and rectilinear motion: The wheels of bicycle will move in rectilinear and in circular motion because the wheel will move forward and its point around the rim will execute circular motion.

(iv) Rotatory motion: The wheels show rotatory motion.

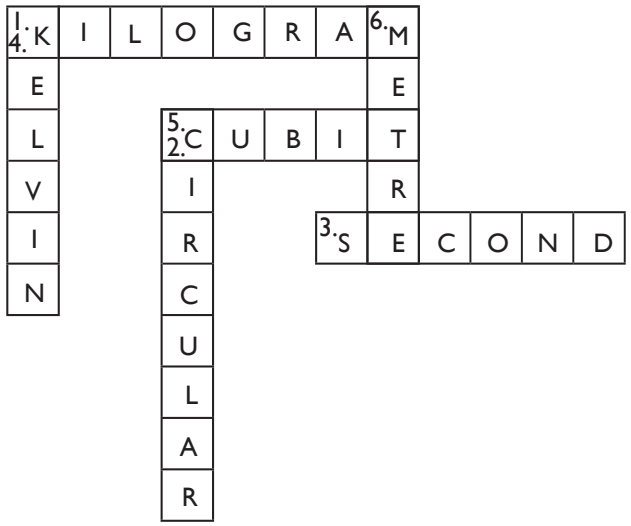
(c) (i) It is a type of motion in which object moves to and fro, i.e., it keeps repeating its motion.

No, it is not necessary that it is always periodic.

(ii) Circular and rotatory motions can be periodic. In circular motion, an object moves in a circular path repeating motion in a fixed time, so it is a periodic motion, e.g., earth moving around the sun. In rotatory motion, an object moves in a circular path about a fixed axis, e.g., potter's wheel moving.

12. An elastic tape is flexible and can be stretched. Thus, each time it will give different readings for the same length measured. Hence, it is impossible to measure an accurate distance from an elastic measuring tape.

ACTIVITY ZONE



08 Light, Shadows and Reflections

WORKSHEET - 1

1. (a) Moon (b) black (c) energy
   (d) straight (e) upside down
2. (d)
3. (a) Shadow is the shape of an object formed on a screen due to light.
   (b) The phenomenon in which light rays are bounced back by a reflecting surface is called reflection.
   (c) The left of the object appears as the right of the image and the right appears as the left. This is called lateral inversion.
4. (a) Rectilinear propagation (b) Reflection (c) Lateral inversion
   (d) Kaleidoscope (e) Bigger

5. (a) (iv) (b) (v) (c) (i)
   (d) (ii) (e) (iii)

6. (a) F (b) T (c) F
   (d) F (e) T

7.

(a)	Luminous objects	Sun	Star
(b)	Non-luminous objects	Moon	Wall
(c)	Natural source of light	Sun	Firefly
(d)	Man-made source of light	Bulb	Torch
(e)	Opaque objects	Book	Eraser
(f)	Transparent objects	Glass	Water

8. a. Yes b. No c. No

9. (a) (ii) (b) (iii) (c) (i)
(d) (iv) (e) (ii) (f) (i)

10. (a) Black
(b) No, it cannot cast a shadow because light will pass through it.
(c) No, moon is not a source of light. It takes light from the sun
(d) Translucent
(e) A shadow is formed when an opaque or translucent object blocks the path of light.

11. (a) It is a plane mirror. A plane mirror forms an image which is virtual, upright, laterally inverted, with same distance from the mirror as the object's distance and the same size as the object.
(b) An image is colourful while a shadow is dark. The size of shadow changes but image in the plane mirror does not change in size at all. An image in mirror can be seen without a screen but a shadow needs a screen to be formed.
(c) Because silver reflects light very efficiently to form a virtual image of the same size of the object.
(d) It forms an image using incoming light in the same way eyes work, while a shadow is formed on a screen when object blocks the path of light.
(e) In case A, the candle will be seen. The property of light shown here is that light travels in a straight line. This is called rectilinear propagation of light.
(f) Yes, an object can form two or more shadows at the same times. For this to happen, there needs to be two or more sources of light around the object.
(g) In case B, no shadow would be formed because there is no screen present behind the object (ball).

12. (a) The fact that rays of light are reflected from a very smooth surface regularly is the reason that we can see our image in the mirror.
(b) (i) The picture shows a bird flying in the sky.
(ii) Birds flying high in the sky do cast their shadow but because they are shading an area that is very tiny, the shadow is not visible. The higher the bird flies, the smaller the shadow it casts.
(c) Join three rectangular mirror strips together to form a prism. Fix them in a circular cardboard tube. Close one end of tube by a cardboard disc having a hole in the centre, through which you can see. Paste a sheet of transparent plastic sheet under cardboard disc. At the other end, touching the mirror, fix a circular plane glass plate. Place on this glass plate several small pieces of coloured glass. Close this end of tube by a ground glass plate. Allow enough space for colour pieces to move around. Your kaleidoscope is ready.
(d) Reflection of light is the process of sending back the light rays which fall on the surface of an object. ACTIVITY: Go in a dark room and ask your friend to hold a mirror in his hands in a corner of room. Stand at another corner and throw light of a torch on the mirror. You will see a patch of light on the other side. Now, adjust the direction of torch so that patch of light falls on another friend standing in the room.

13. Our image is formed when reflection of light takes place. Since window pane is transparent, so light passes through it, and no reflection of light takes place. Therefore, we are not able to see our image in a window pane.

ACTIVITY ZONE

(a)

Dog

Goat

Rabbit

Wolf

(b)

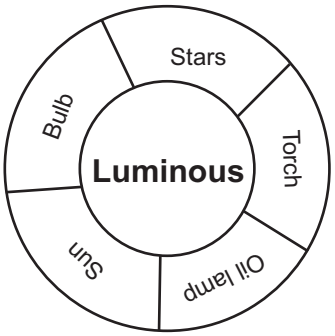
A	R	E	C	T	I	L	I	N	E	A	R	R
K	E	Z	K	S	C	T	F	I	L	M	T	I
M	F	F	R	F	A	M	B	A	K	L	G	N
G	L	U	M	I	N	O	U	S	T	A	R	S
H	E	L	P	R	D	O	L	U	R	M	S	Q
I	C	Z	U	E	L	N	B	N	P	P	R	Q
V	T	W	X	F	E	O	U	V	W	X	A	B
Y	I	M	N	L	S	H	A	D	O	W	I	K
F	O	C	I	Y	M	K	F	R	D	M	F	L
E	N	D	J	L	M	N	Q	S	L	E	U	M

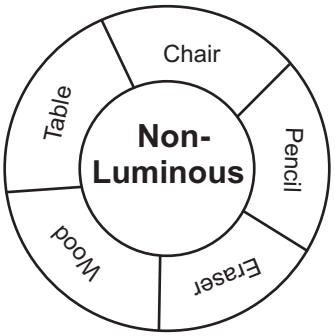
WORKSHEET - 2

1. (a) T (b) T (c) T
   (d) T (e) F
2. (a) night (b) Book (c) shadow
   (d) visible (e) plane

3. (a) (i) (b) (i) (c) (iii)
   (d) (i) (e) (ii)

4.





5. (a) (iii) (b) (i) (c) (iv)
(d) (ii) (e) (vi) (f) (v)

6.

Alphabets	B	D	F	K	L	N	S	Z
Images	ꓭ	ꓷ	ꟻ	ꓘ	⅃	ᴎ	Ƨ	Ƹ

7. (a) Moon (b) Translucent
(c) Non-luminuous (d) Luminuous

8. (a) In lunar eclipse, sun, earth and moon come in a straight line and the earth is in the middle of sun and moon. In this case, shadow of earth falls on the moon, thereby blocking the sunlight on the moon.
(b) In solar eclipse, sun, moon and earth come in a straight line and the moon comes in between the sun and earth. The moon casts a shadow on parts of the earth, hence the sun will not be visible from that part of the earth.

9. (a) A screen is a flat surface on which a shadow is formed.
(b) Because there is a wall between two rooms which is opaque. But we can see only through transparent objects.
(c) Transparent
(d) No, we cannot see our reflection in a mirror in a completely dark room.

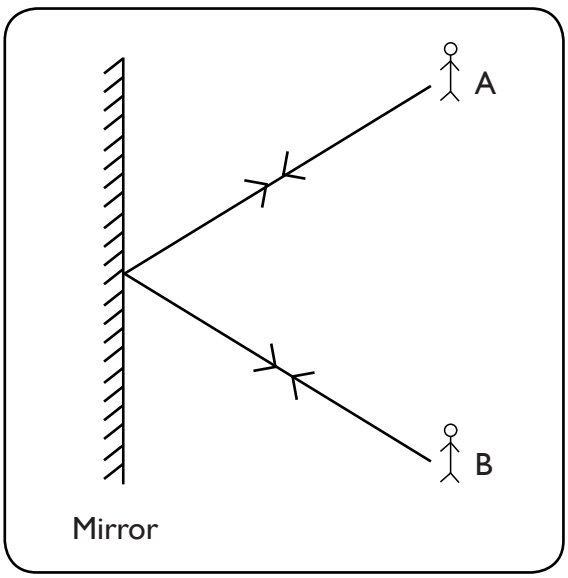
10. (a) On increasing the distance between object and light source, the size of shadow formed decreases.
(b) Because these do not produce light on their own. They only reflect the light that falls on them.
(c) It will be different because shape or size of shadow depends on the parts of object on which light falls. In case (i), a circular shadow is formed while in case (ii), a long shadow is formed.
(d) It is because of scattering of sunlight through air, which makes light enter the room by windows and ventilators in diffused form. Thus the room is lighted even if direct sunlight does not enter it.
(e) Yes, it is done so that every person driving vehicle in front of it can see it uninverted and give side to ambulance. The mirror image of 'AMBULANCE' is 'ƎƆИALUBMA'
(f) (i) The reflected light will fall on person C.
(ii) Person C will be visible to person E in the mirror.

11. (a) (i) There are multiple shadows on a football field because there are multiple light sources installed there.

(ii) It happens because the angle at which the sun shines on stationary objects changes with the rotation of the earth.

(b) (i) They are standing such that the light rays from A reach mirror and get reflected to reach B. Likewise, the light rays from B reach mirror and get reflected to reach A.

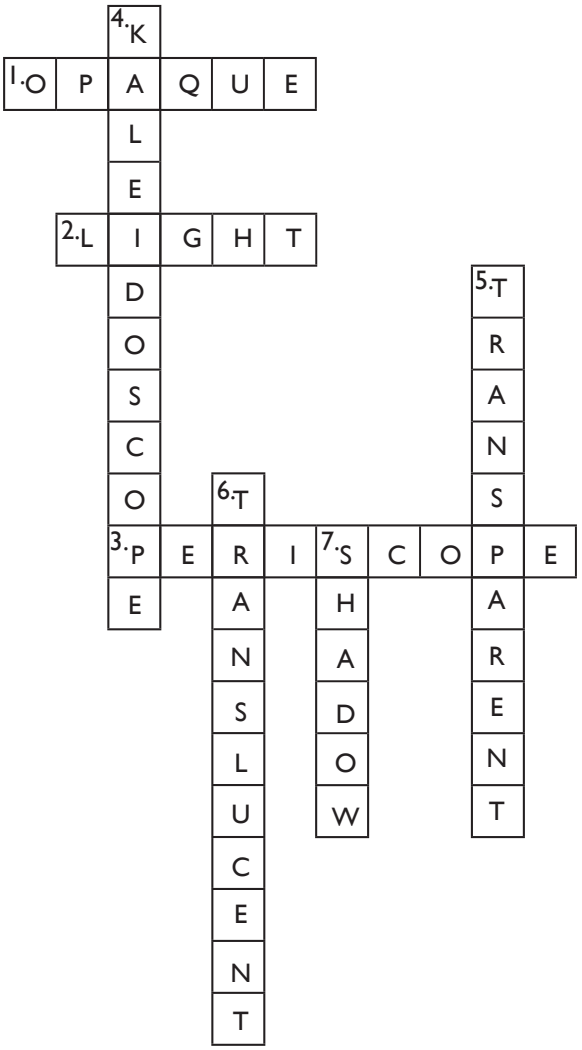
(ii)



(iii) This phenomenon is known as reflection of light.

12. To obtain same size shadow, keep the pencil at an equal distance between the wall and the candle.
To obtain small size shadow, take the pencil away from candle and close to wall.
To obtain big size shadow, take the pencil away from wall and close to candle.

ACTIVITY ZONE



09 Electricity and Circuits

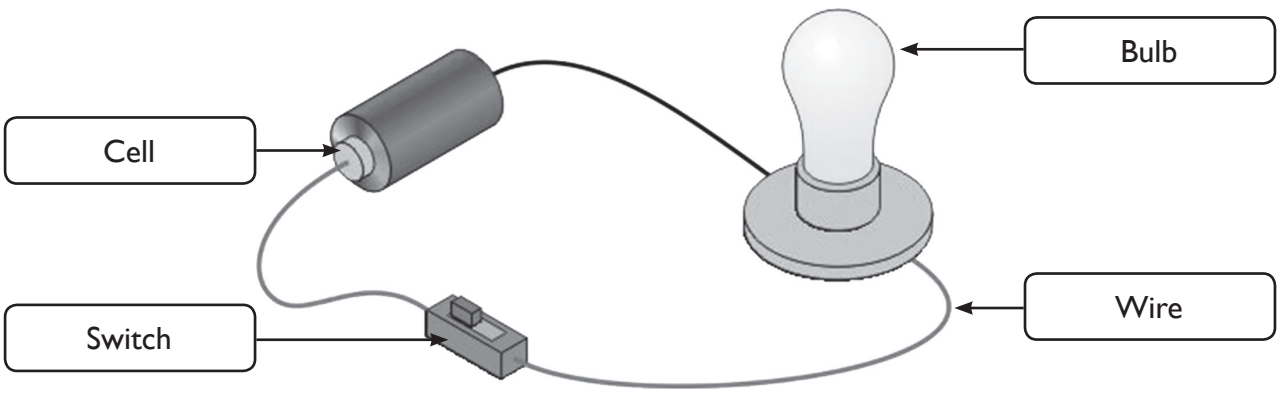
WORKSHEET - 1

1. (a) (ii) (b) (iii) (c) (iii)
   (d) (ii) (e) (iv) (f) (ii)

2. (a) energy (b) electricity (c) Bulb
   (d) circuit (e) good (f) breaks
   (g) insulators

3. (a) F (b) T (c) F
   (d) F (e) F

4.



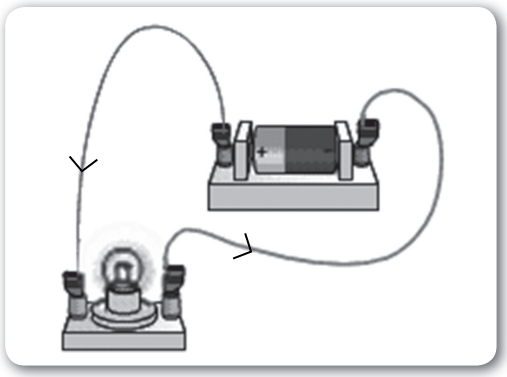
5. (a) (iii) (b) (iv) (c) (i)
   (d) (ii) (e) (vi) (f) (v)

6. (a) Iron (b) Metal (c) Cloth
   (d) Dry cell (e) Safety pin

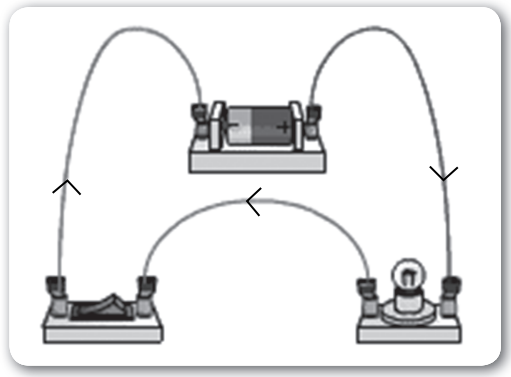
7.

Conductors	Insulators
Iron	Plastic
Sewing needle	Wall
Graphite	Glass bangle
Aluminium foil, key	Wood, Cardboard

8.



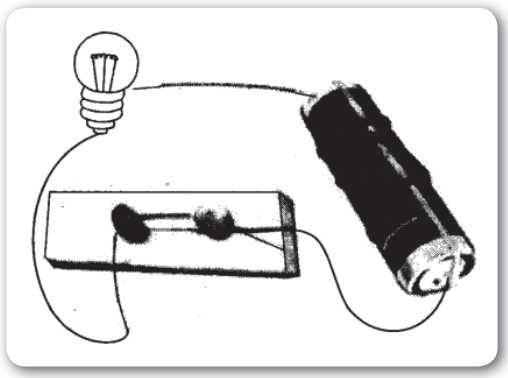
A



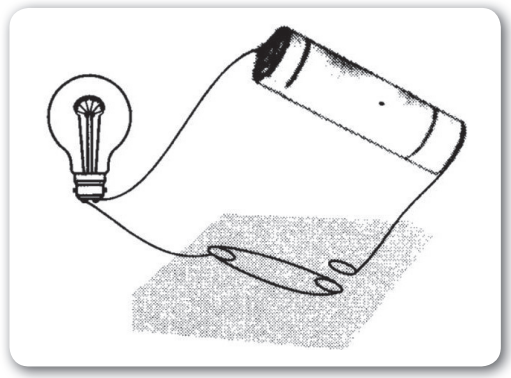
B

9. (a) Electric cell is a source of energy. It produces a small amount of electricity from chemicals stored inside it.
   (b) Alarm clock, wrist watch, transistor, torch, camera, etc.
   (c) The chemicals in the cell will get used up very fast and cell will stop working.
   (d) Plastic
   (e) Switch, battery, bulb

10. (a) No, the bulb would not glow in that case because the circuit will not be completed as rubber is an insulator and it will not allow the current to flow through it.
   (b) When the chemicals in electric cell are used up, it stops producing electricity.
   (c) Fused bulb means filament is broken. So the circuit is not completed and bulb does not light up.
   (d)



On



Off

(e) In that case, electricity could scatter all around in atmosphere nearby power stations. The men at work could die with electric shocks. The electricity could not be transmitted to homes and factories from power stations.

(f) 1. A case that encompasses the parts of torch. 2. A spring or strip of metal (contact throughout the torch). 3. Switch of torch. 4. Reflector. 5. Lamp, 6. Lens. 7. A part of torch where batteries are inserted.

(g) Conductors allow electric current to pass through them, e.g., iron, copper. Insulators do not allow electric current to pass through them, e.g., wood, rubber.

11. (a) (i) It is a fuse.

(ii) A fuse is used in an electric circuit for safely purpose. It prevents the flow of excessive current in the circuit by breaking itself.

(iii) If it is not used in the electric circuit, it may damage the electrical appliance, in case excessive current flows through it.

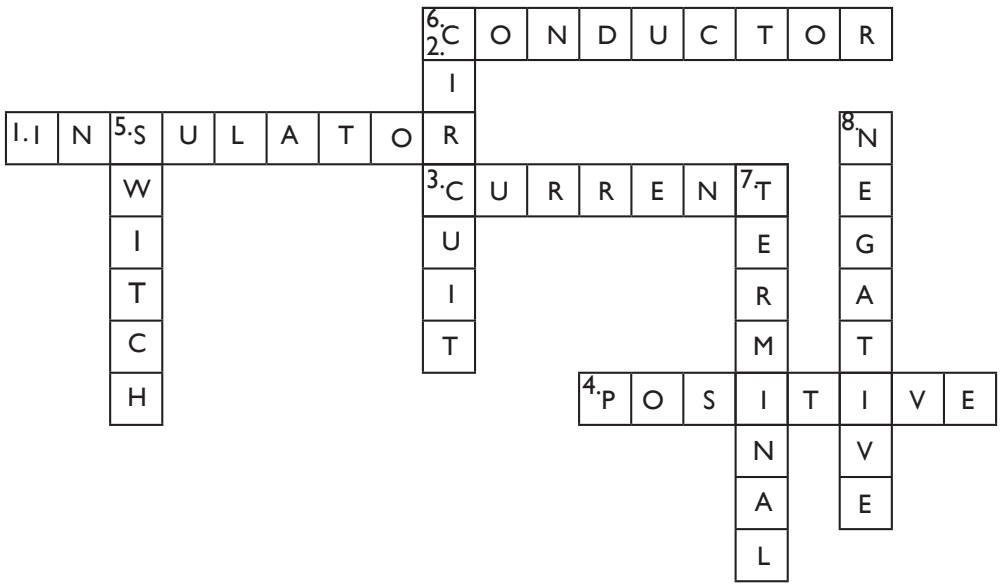
(b) (i) Because the rubber being an insulator will check the contact of hand with naked wire if there is any.

(ii) Because electricians have to touch naked wires with pliers and screwdrivers. Plastic or rubber covering checks the flow of electricity.

(iii) Because birds are not good conductors of electricity. Their cells and tissues do not offer electrons an easier route than the copper wire they are already travelling along. So, electricity bypasses the birds and keeps flowing along the wire instead.

12. Because silver is much more expensive than copper. In addition, it oxidises easily and tarnishes when it comes in contact with air.

ACTIVITY ZONE



WORKSHEET - 2

1. (a) (iii) (b) (v) (c) (i)
   (d) (ii) (e) (iv)

2. (a) F (b) T (c) T
   (d) F (e) T

3. (a) Glows – Because circuit is complete.
   (b) Does not glow – Because circuit is incomplete as both wires are connected to negative terminal of battery.
   (c) Glows – Because circuit in complete.
   (d) Does not glow – Because circuit is incomplete as both wires are connected to positive terminal of battery.

4.

Take a torch bulb and a piece of wire.

↓

Remove the plastic covering at the two ends of the wire.

↓

Wrap one end of the wire around the base of the electric bulb.

↓

Fix other end of the wire to the negative terminal of the elctric cell with a rubber band.

↓

Bring the tip of the base of the bulb, that is, its other terminal in contact with the positive terminal of the cell.

5. (a) Toy car (b) Glass case (c) Candle
(d) Rubber band (e) Wet hands

6. (a) Filament (b) Insulators (c) Electrical appliances
(d) heat to light energy (e) Conductors

7. (a) Battery (b) Bulb
(c) Cell (d) Switch

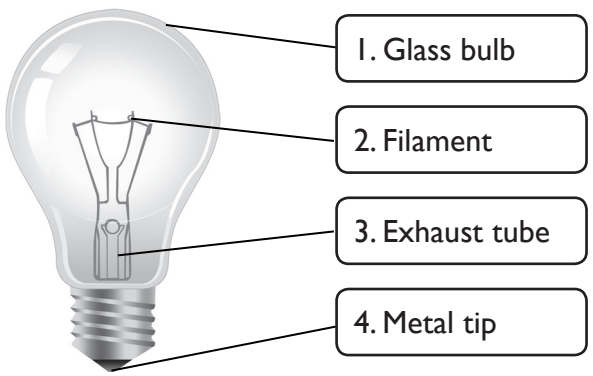
8. (a) sliding (b) Iron (c) electric
(d) fused (e) Battery

9. (a) (ii) (b) (iv) (c) (iii)
(d) (iii) (e) (i)

10. (a) A switch can make or break the circuit in on and off positions respectively.
(b) Aluminium foil
(c) Button cells
(d) Wires connect the various components of electric circuit.
(e) Fuse

11. (a) We can find the conductivity of a household item by passing current through it in a circuit. If it passes current, it is conductor, otherwise an insulator.
(b) Arrangement C should be avoided. In this arrangement, positive terminal of battery is connected with negative terminal and no other component is there. In this way, battery gets used up very fast and it stops working.
(c) Do not touch an electrical appliance with wet hands or feet. Maintain a certain distance from energised circuits. Shut off the power source before inspecting or repairing an appliance.
(d) Yes, both work on the same principle, i.e., heating effect of electric current. In an electric bulb fuse wire gets heated to such a high temperature that it starts glowing. In an electric heater, electric current flows through element and it radiates heat.
(e) In this circuit arrangement, bulb A glows first because in an electic circuit, the current flows from positive terminal to the negative terminal of the battery.

12. (a) (i) Yes, reflector is a part of torch.
(ii) Car headlights, solar cooker, spotlights, PAR lamps, satellite dishes
(iii) It is used to direct light from a source through reflection.
(b) (i) It is a source of energy which produces a small amount of electricity from chemicals stored inside it.
(ii) Torch, camera, transistor, alarm clock, wrist watch, etc.
(iii) Two terminals – negative and positive.
(iv) From negative to positive terminal.
(c) (i) Because glass is transparent and it can withstand high temperature.
(ii) In a bulb, two thick wires at the ends support the filament.



(iii) The bulb glows when there is a flow of current and the circuit is complete. So, two terminals are present, one for inlet and other for outlet.

(iv) Electrical energy → Heat energy → Light energy

13. (i) The cells may have been used up.

(ii) The bulb may be fused.

(iii) The cells may not be placed in the correct order.

ACTIVITY ZONE

C	Z	B	U	L	B	Q	R	H	I	F	C	K	L	G
O	T	A	I	Z	K	F	I	L	A	M	E	N	T	S
N	N	T	P	T	I	U	N	U	K	S	I	F	E	T
D	E	T	J	Z	W	S	S	W	I	T	C	H	R	H
U	R	E	N	V	T	E	U	I	F	I	E	Z	M	C
C	R	R	H	P	J	U	L	R	I	M	L	T	I	N
T	U	Y	T	K	J	L	A	E	F	I	L	T	N	T
O	C	I	R	C	U	I	T	H	T	E	Z	H	A	R
R	E	F	L	E	C	T	O	R	L	I	M	E	L	S
L	K	H	M	T	T	O	R	C	H	T	J	K	F	H

10 Fun with Magnets

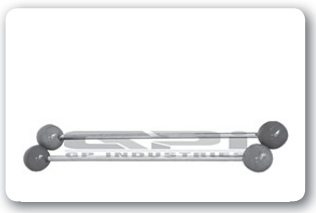
WORKSHEET - 1

1. (a) Iron (b) heating (c) two
   (d) poles (e) lodestone
2. (a) T (b) F (c) F
   (d) T (e) T
3.

Horse shoe magnet

Bar magnet

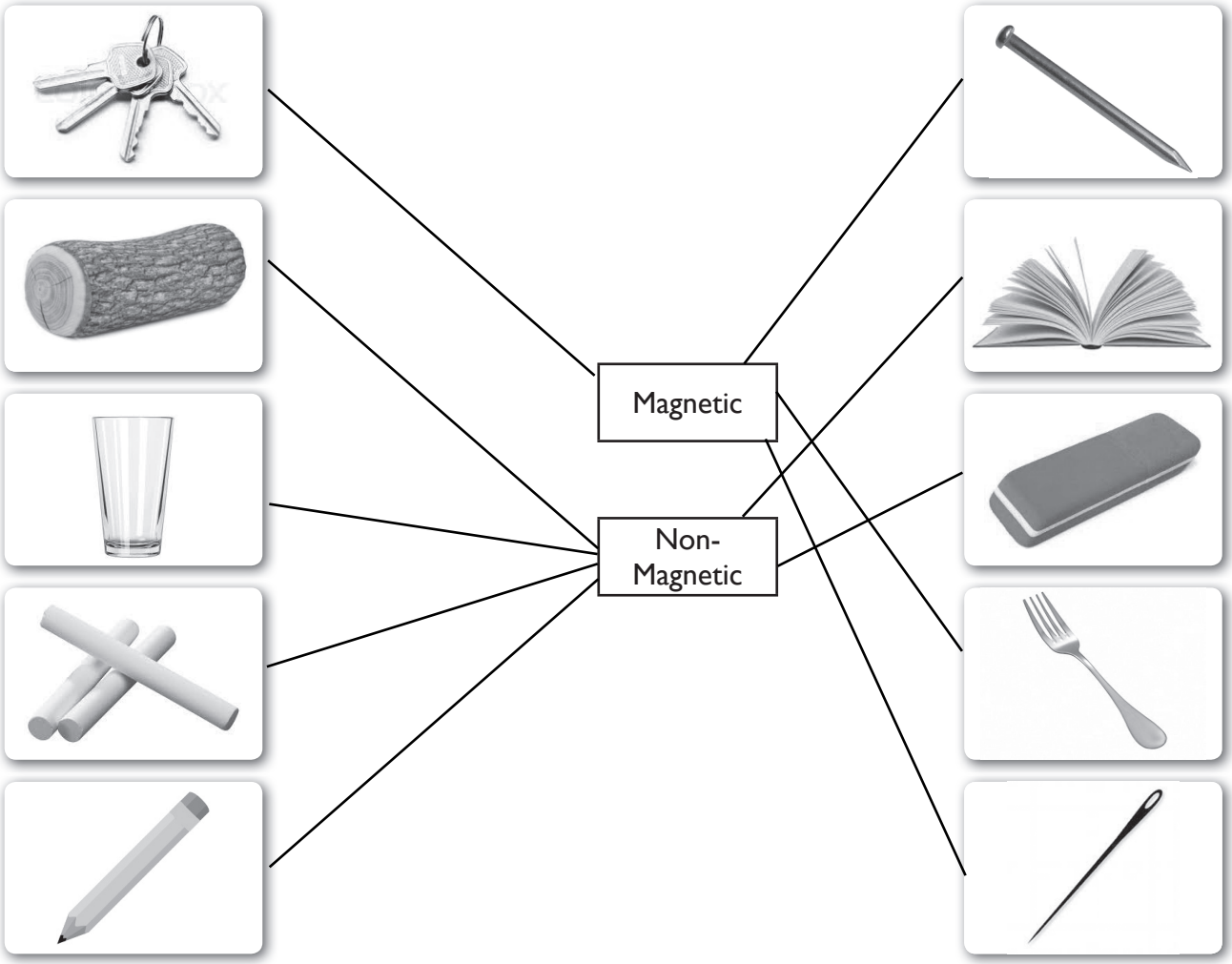
Cylindrical magnet



Ball-ended magnet

4. (a) It is a grey-black magnetic mineral which consists of an oxide of iron and is an important form of iron ore.
   (b) The ends of a bar magnet are called the poles of a magnet.
   (c) It is a process by which a magnet loses its magnetic properties.

5.

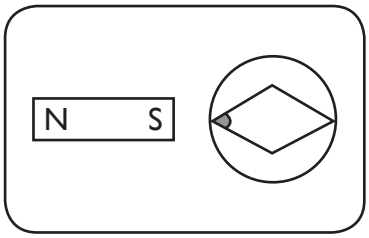


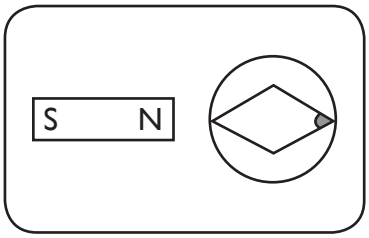
6. (a) North-South direction (b) Loadstone (c) Iron Bar
(d) Repulsion (e) Attraction

7. (a) (ii) (b) (iv) (c) (v)
(d) (i) (e) (iii)

8. (a) (iv) (b) (iv) (c) (ii)
(d) (iv) (b) (iv)

9.





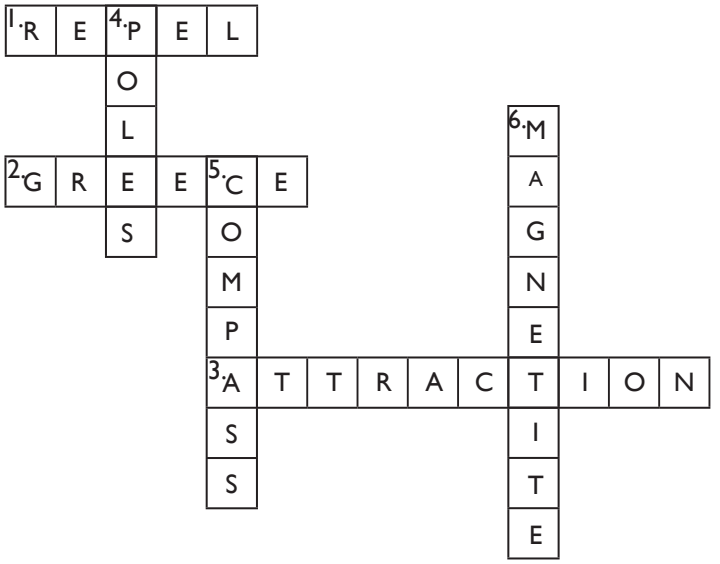
10. (a) Magnes, a shepherd (b) Greece
(c) At the ends (d) North-South direction

11. (a) Rag pickers carry a piece of magnet with them. Wherever they feel there may be iron pieces, they bring magnet near the heap of waste and iron pieces stick to it.
(b) Magnetic compass
(c) Magnets lose their magnetic property when they are heated strongly, beaten or dropped on a hard surface.
(d) Magnetic compass is a small magnetic needle enclosed in a box with a glass cover. Compass needle is kept in a closed glass vessel because it may deflect in any direction due to pressure exerted by air, if kept in open.
(e) No, magnetic poles do not exist separately like charges. It is not possible to isolate a north pole from south pole of a magnet by cuttng it. If we cut a bar magnet, we will get two new bar magnets. Thus, magnetic poles always exist in pairs.

12. (a) (i) A magnet is being made in the Figure
(ii) An iron bar can be magnetised by rubbing it with a magnet in one direction for some time.
(iii) We can check this by bringing a pin or some iron filings near the iron bar. They will stick to the iron bar if it has been magnetised.
(b) (i) On suspending freely, a bar magnet comes to rest in North-South direction. The end towards north is north pole while end towards south is south pole.
(ii) Yes, horseshoe magnet also has poles.
(iii) Poles are present at the ends.
(iv) For storing horse shoe magnet, a piece of iron should be kept across its poles.

13. Bar magnets should be kept in pairs with their unlike poles on the same side. They must be separated by a piece of wood while two pieces of soft iron shoule be placed across their ends. For horse shoe magnet, one should keep a piece of iron across the poles.

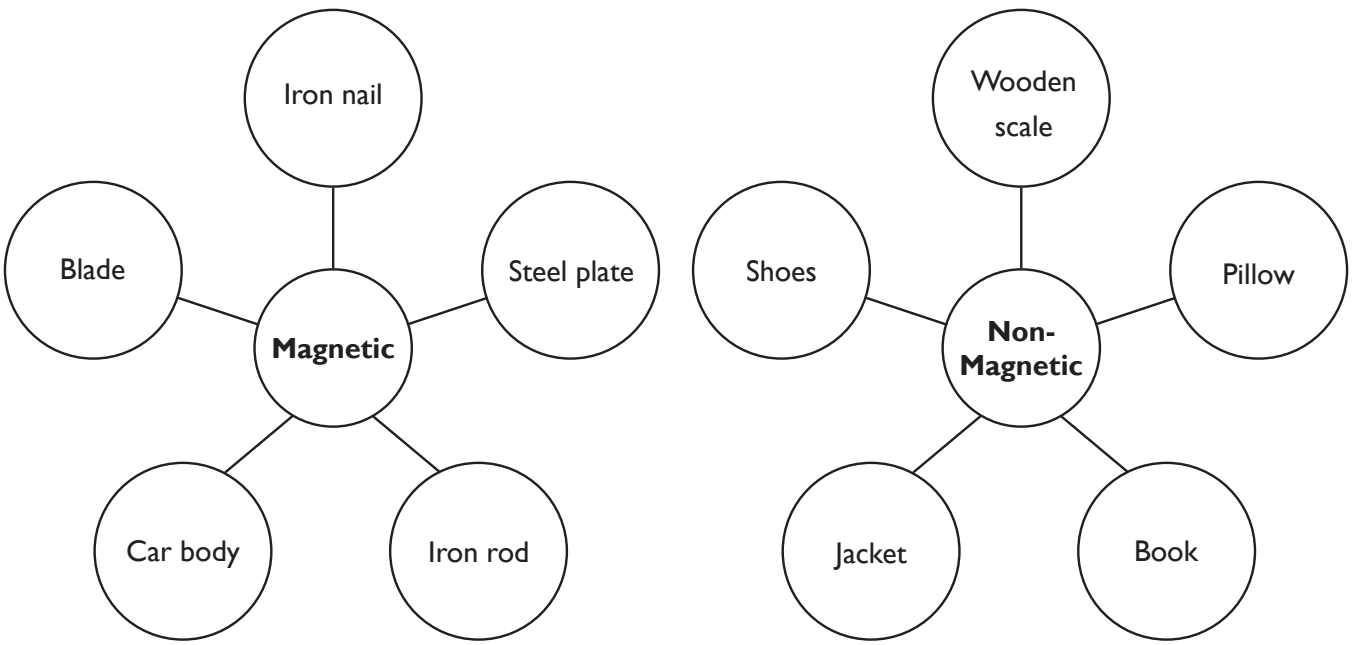
ACTIVITY ZONE



WORKSHEET - 2

1. (a) (iii) (b) (i) (c) (iii)
   (d) (i) (e) (ii)

2.



3. (a) Repulsion (b) Soft iron/wood (c) Credit card
   (d) Heating (e) Electro magnets
4. (a) T (b) F (c) F
   (d) T (e) F

5. (a) Attraction (b) Repulsion
(c) Repulsion (d) Attraction

6. (a) south (b) attracted (c) repel
(d) poles (e) natural

7. (a) Plastic (b) Aluminium (c) Magnetic separation
(d) Loadstone (e) Pin

8. (a) Yes, the vessel would have to be buried in the earth for many years to magnetise it.
(b) Maximum iron filings will stick towards the poles.
(c) We can separate magnetic materials by bringing a magnet near the mixture. The magnetic materials will stick to it.

9. (a) Because these devices are made up of magnetic materials and magnets in them. Bringing a magnet closer to these devices can spoil them.
(b) Suspend the rods separately and bring one end of a bar magnet close to both the ends of them. Iron rod will show attraction at both ends while magnet will show attraction at one end and repulsion at the other end.
(c) Natural magnets are found in nature, e.g., magnetite, pyrrhotite. Artificial magnets are made from artificial means and are man-made, e.g., neodymium magnet and refrigerator magnet.
(d) Magnet A has more strength than magnet B, because it shows more density of magnetic field lines. (The strength of a magnet is represented by the density of magnetic field lines.)
(e) It is because earth itself shows magnetism. The north pole of earth attracts the south pole of magnet and vice versa as opposite charges attract each other.

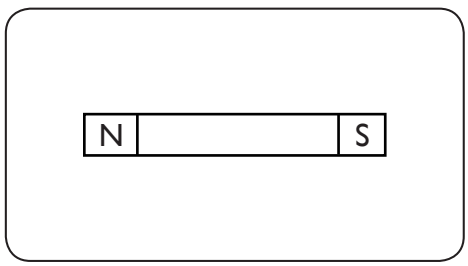
10. (a) (i)
- Magnetic compass is used in aeroplanes and ships to find directions.
- Magnets are used in motors, telephones and electric doorbells.

(ii)
- Magnets should be stored such that unlike poles are on the same side.
- These should be kept away from electronic devices like TV.

(iii) An electromagnet is a soft metal core made into a magnet by the passage of electric current through a coil surrounding it.

(b) (i) The device is a compass needle.
(ii) It is used to find directions usually in ships and aeroplanes.
(iii) Because a compass can be used anytime anywhere while sun and stars cannot tell the directions during bad weather.

(c) (i)



(ii) Yes. On suspending freely, a bar magnet points towards north-south direction. East and west are perpendicular to north and south.

11. A U-shaped (horse shoe) magnet should be kept with a piece of iron across the poles. Though bar magnets should be kept in pairs with their unlike poles on the same side. They must be separated by a piece of wood while two pieces of soft iron should be placed across their ends.

ACTIVITY ZONE

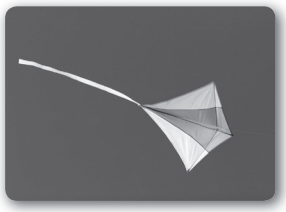
P	T	F	M	K	R	L	T	M	T	T	K	L	J	M
E	A	T	T	R	A	C	T	I	O	N	M	S	O	C
R	K	K	T	E	M	P	O	R	A	R	Y	R	C	H
M	S	L	U	P	O	L	E	S	I	T	I	E	R	L
A	M	I	V	U	M	O	F	C	M	K	M	T	T	Z
N	R	M	W	L	I	T	O	H	I	F	Y	L	X	Y
E	P	G	X	S	O	U	T	H	P	O	L	E	T	U
N	J	S	T	I	T	N	T	O	U	K	G	L	M	Z
T	G	Z	C	O	M	P	A	S	S	J	T	U	L	E
I	M	T	C	N	O	R	T	H	P	O	L	E	M	E

11 Air Around Us

WORKSHEET - 1

1.



✓ ☐ ✓ ✓




☐ ☐ ☐ ✓

2. (a) F (b) T (c) F
(d) T (e) F

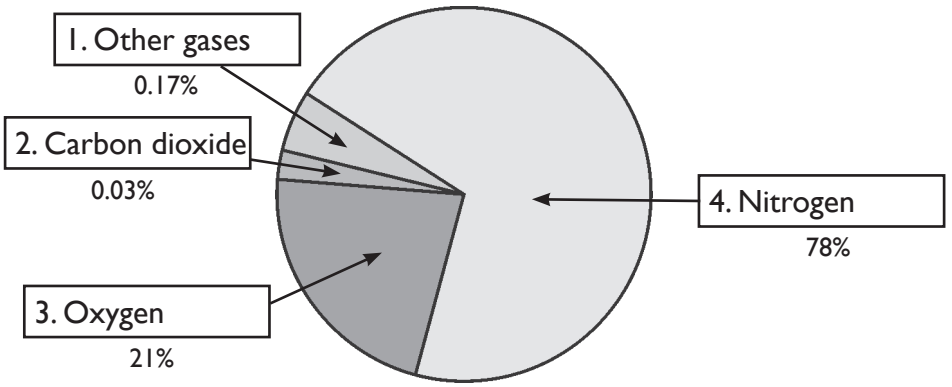
3. (a) (vi) (b) (iv) (c) (i)
(d) (ii) (e) (iii) (f) (v)

4. (a) Atmosphere (b) Lungs (c) Carbon dioxide
(d) Water vapour (e) Amphibians

5. (a) (vi) (b) (iv) (c) (i)
(d) (ii) (e) (iii) (f) (v)

6. (a) Toy car (b) Ice (c) Photosynthesis
(d) Stomach (e) Smoke

7.



8. (a) wind (b) mixture
(c) direction (d) cylinders

9.


Lungs


Lungs


Gills


Skin


Skin


Stomata

10. (a) Nitrogen gas
(b) Oxygen
(c) Photosynthesis
(d) When air comes in contact with a cool surface, it condenses and drops of water appear on cool surface.

11. (a) We are able to see upto a long distance just after the rain because the raindrops load the dust particles with water. They become heavier and quickly settle down on the ground.
(b) The figure shows the Tyndall effect. The Tyndall effect is the scattering of light as a light beam passes through a colloid. The individual suspension particles scatter and reflect light, making the beam visible.
(c) Because air can be separated into its constituents like oxygen, nitrogen, etc., by physical means. Air shows properties of all the gases present in it.
(d) A windmill is a structure which converts energy of wind into rotational energy by means of vanes called sails or blades. Windmill is used to draw water from tubewells and to run flour mills. A windmill is also used to generate electricity.
(e) In this activity, two candles are lighted and one of them is covered with an inverted glass jar. After some time , candle covered with glass jar stops burning, while the other one continues burning. It shows that an important component of air, oxygen, is needed for burning.

12. (a) (i) Burning eventually blows off as it requires oxygen which is used up. Carbon dioxide gets accumulated in the room.

(ii) To show it, we take water in a pan and heat it. Just before it boils, we notice some bubbles at the inner surface of the pan. These bubbles are formed because of air dissolved in water.

(b) (i) Cloth face mask.

(ii) He is putting a cover on his nose due to the air pollution.

(iii) Air quality is poor and the air is polluted because of the emissions of road traffic.

(c) (i) Crocodile does so to take in oxygen and give out carbon dioxide.

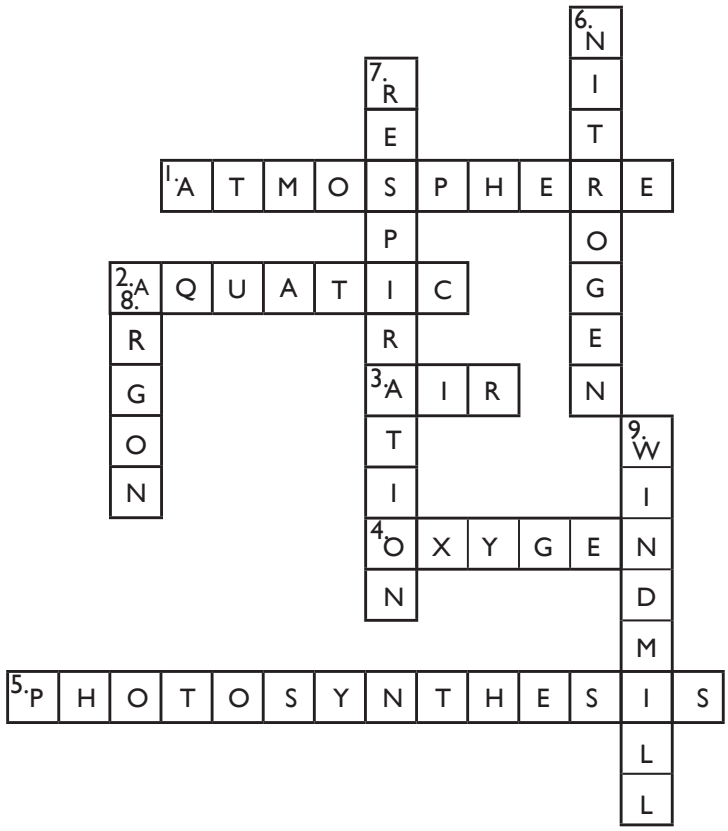
(ii) Dog and cat

(iii) Because the rainwater displaces the air present in soil which these animals use to breathe. So, they come up to the surface of earth for breathing.

(iv) Because blanket cuts the supply of oxygen to the object that is burning, thereby prevents it from further burning.

13. Plants use carbon dioxide during the process of photosynthesis and give off oxygen as waste product. And animals, including humans, take in oxygen while breathing and give out carbon dioxide. Thus they depend on each other for oxygen and carbon dioxide.

ACTIVITY ZONE



WORKSHEET - 2

1. (a) (vi) (b) (i) (c) (ii)
   (d) (iii) (e) (iv) (f) (v)

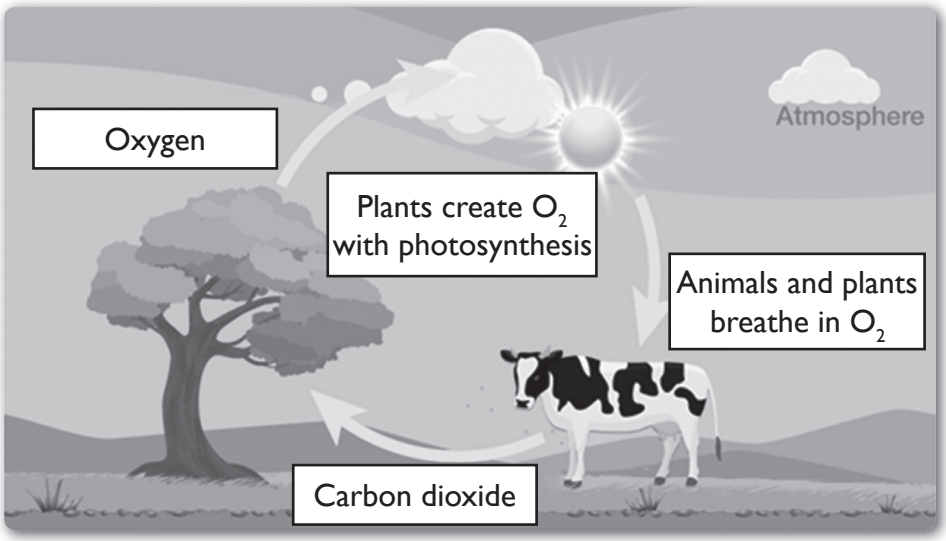
2. (a) F (b) T (c) T
   (d) T (e) T

3. (a) motion (b) dust (c) water vapour
   (d) earth (e) space

4. (a) Aquatic animals take in air dissolved in water during respiration.
   (b) Air with motion is called wind.
   (c) Nitrogen/oxygen make major part of air.

5. (a) DUST (b) OXYGEN (c) WINDMILL
   (d) SMOKE (e) RESPIRATION (f) ATMOSPHERE

6. (a) (i) (b) (iii) (c) (iv)
   (d) (iii) (e) (ii)

7. 

8. (a) Leaves of trees move due to the wind.
   (b) Respiration
   (c) Nitrogen
   (d) Because the air goes out of the lump and it shrinks.
   (e) Summer season

9. (a) The image suggests that the air has mass.
   (b) Yes, all plants require nitrogen for healthy growth and development. Plants also use nitrogen in the process of photosynthesis.

(c) Ozone layer protects everything living on earth from harmful ultraviolet (UV) rays from the Sun.

(d) It is wise to sleep under a tree during the day and not at night, because at night trees give out carbon dioxide and take in oxygen.

(e) In this activity, when the bottle is pushed in water in inverted position, water does not enter it, but when it is tilted sideways, bubbles form in the water and water enters the bottle. This happens because on tilting the bottle, air inside the bottle comes out and water enters the bottle. This proves that air occupies space.

10. (a) (i) Mountaineer

(ii) He is carrying oxygen cylinder to avoid suffocation. Because of higher altitudes, layer of air becomes thinner, which decreases the number of oxygen molecules per breath.

(iii) He might be going to mountainous regions.

(b) (i) (a) Smoke – In cities (b) Dust – In cities

(c) Water vapour – In coastal areas (d) Carbon dioxide – More populated areas

(ii) (a) Smoke can be reduced by using less vehicles, using public transport, car pooling, etc.

(b) Dust can be reduced by planting more trees, by avoiding opening of unpaved surfaces for traffic use and by planting grass on unpaved surfaces.

(c) Water vapour can be reduced by reducing levels of other greenhouse gases in the air.

(d) CO_2 can be reduced by planting more and more trees.

11. (a) (i) Carbon dioxide is important because it is used by plants during photosynthesis. It also helps to regulate temperature on earth and can absorb infrared radiation.

(ii) It would increase greenhouse effect. More thermal energy would be trapped by the atmosphere, causing earth to be warmer. It results in global morning.

(b) Because long chimneys take harmful smoke and gases produced in factories high up in the air so as to reduce its harmful effects on the ground. The lungs of birds become more prone to diseases.

ACTIVITY ZONE

W	B	U	R	N	I	N	G	Z	N	K	T	L	I
I	G	F	R	S	O	Z	O	N	E	G	K	M	P
N	T	R	S	O	I	L	F	G	G	I	L	L	S
D	I	E	G	K	X	X	S	M	O	K	E	U	L
M	M	L	Z	E	F	Y	A	I	R	J	T	R	S
I	T	O	S	J	J	T	G	T	T	S	U	D	P
L	N	O	A	P	V	Z	A	E	I	Q	T	O	Z
L	N	K	R	S	P	M	W	I	N	D	U	M	N
M	R	E	S	P	I	R	A	T	I	O	N	S	O