केन्द्रीय विद्यालय संगठन

KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

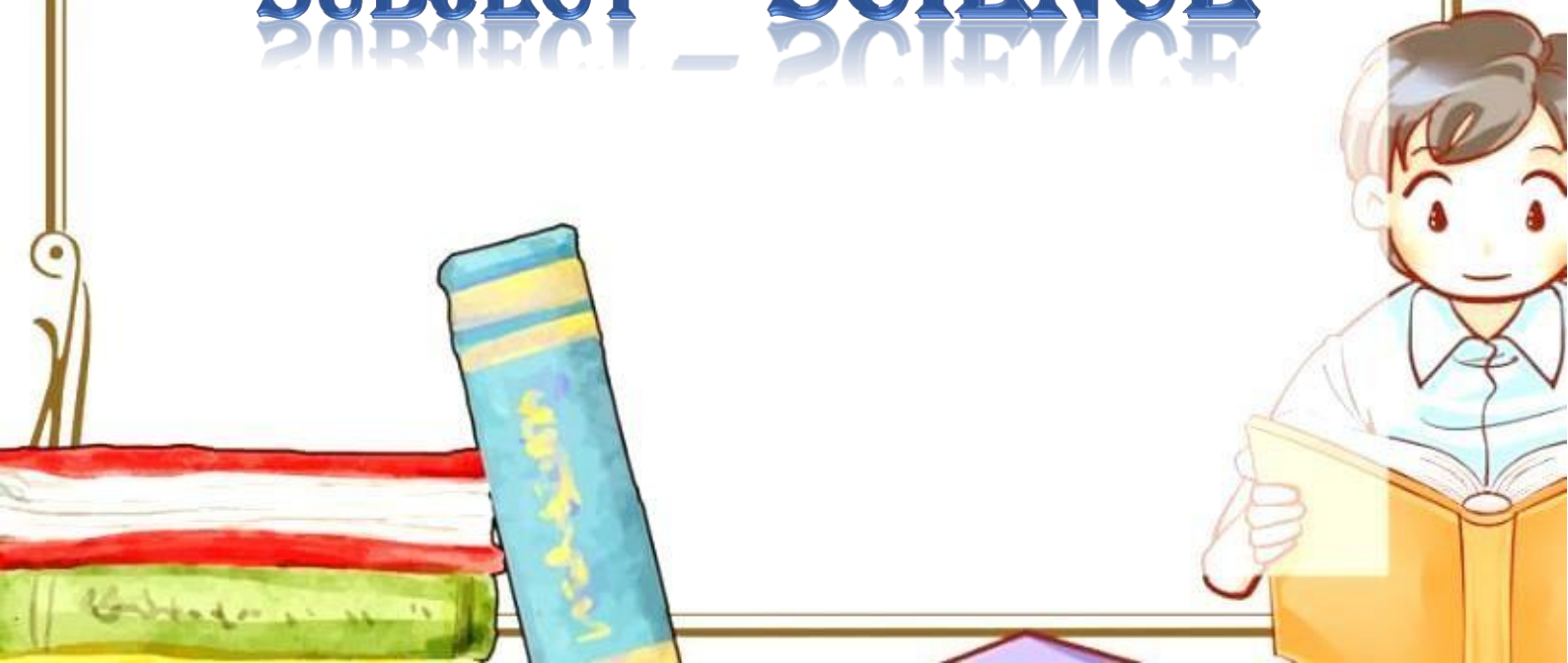
STUDY MATERIAL

TERM-II

SESSION 2021-22

CLASS – VI

SUBJECT – SCIENCE



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CONTENT

SYLLABUS

Chapter No.	Name of the Chapter
11	Light, Shadows and Reflections
12	Electricity and Circuits
13	Fun with Magnets
14	Water
15	Air Around us
16	Garbage in, Garbage out

LESSON- 11

LIGHT, SHADOWS AND REFLECTIONS

WOLF AND HIS SHADOW

Once upon a time there lived a wolf in a forest. One evening he was running in the sun shade. The setting sun cast his shadow far out on the ground, and it looked as if the wolf were a hundred times bigger than he really was.

"Why," exclaimed the Wolf proudly, "see how big I am! Fancy me running away from a Lion! I'll show him who is fit to be king. I will be king of this jungle.

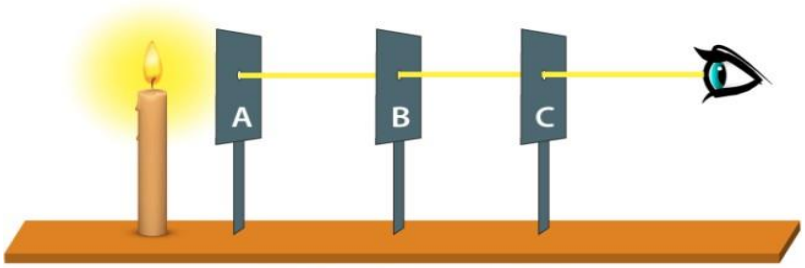
He went to the lion and said I am bigger than you and come I will show you how much big I am? The lion replied o show me. Just then an immense shadow blotted him out entirely. He got scared and the next instant a Lion struck him down with a single blow.

Light as a form of energy

- Light is the energy that enables us to see.
- Light is emitted from a source such as the Sun.

Rectilinear propagation of light

Light takes the quickest path between any two points. Therefore, light travels in a straight line. This is known as a rectilinear propagation of light.



Light Travels in straight line

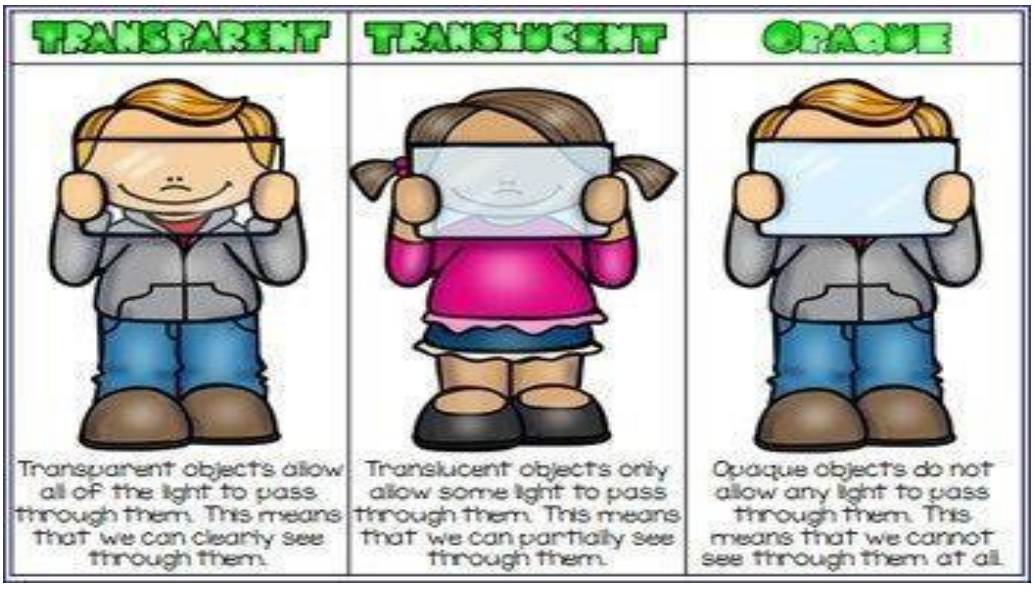
Luminous & Non-luminous objects

- Objects that emit light are known as luminous objects. E.g.: Sun andother stars
- Objects that do not produce their own light but reflect the light emitted by luminous objects are known as non-luminous objects. E.g.: Earth, trees.

Transparent, Opaque and Translucent objects

Objects can be classified based on their interaction with light.

- Transparent objects allow light to pass through them without getting scattered. E.g.: glass
- Translucent objects allow light to pass through them partially. E.g.: Butter paper
- Opaque objects do not allow any light to pass through them. E.g.: a table, a book, etc.



What is Reflection?

When light rays fall on a highly polished (e.g. mirror) smooth surface and return to the same medium, it is called reflection of light.

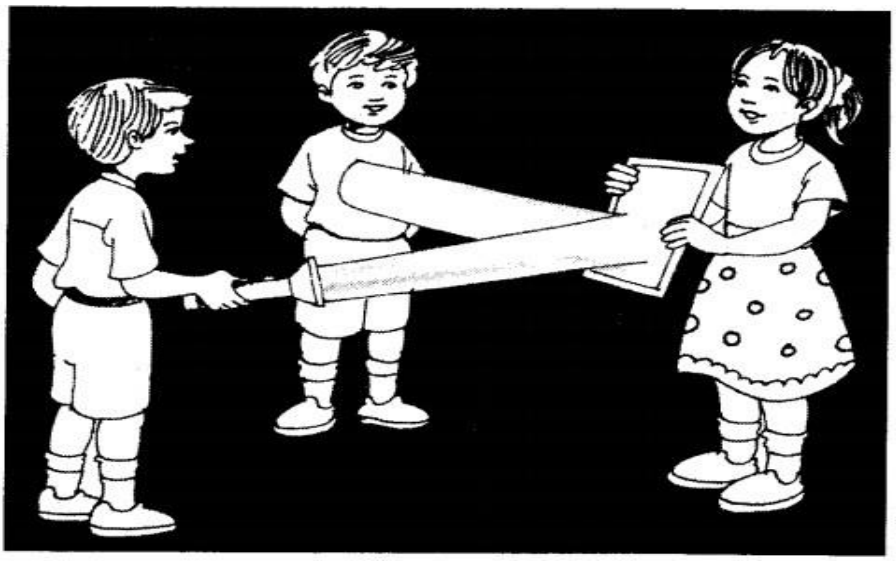


Fig. 11.14 A mirror reflects a beam of light

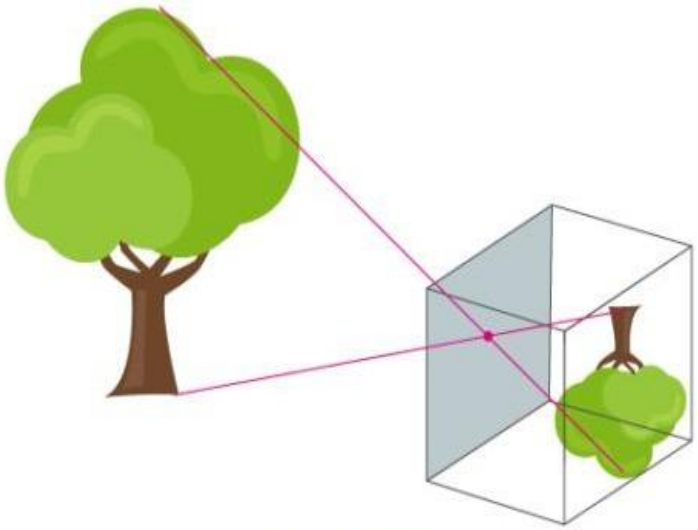
How a Shadow is formed ?

- A shadow is formed when an opaque object comes in the path of light.
- A shadow needs a screen where it is formed, for example, the ground, or walls of a room or even the surfaces of buildings.
- Shadows give us an idea about the shapes of different objects. Or, it can even mislead us about the shape of different objects. E.g. the shadow of a cone appears to be a triangle on the screen.

The Pinhole Camera - Formation of image by pinhole camera

- A pinhole camera is a simple camera that consists of a light-proof box, a thin film for a screen and a small aperture or hole to allow the passage of light rays.

- The light from outside enters through the small hole and forms an image on the screen that is inverted.



Pinhole camera

Mirrors and Reflection

Mirrors

A mirror is a surface usually consisting of a glass that reflects light incident on it to form clear erect images.

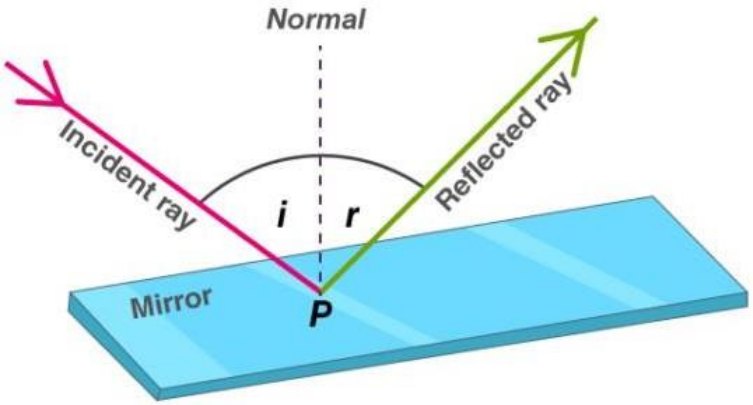
Reflection

When light is incident on a surface, it gets reflected or it bounces back. Any surface that is really well polished or shiny acts like a mirror. The phenomenon of light bouncing off surfaces is called reflection.

Characteristics of images

- Images have colour, unlike shadows. They are formed due to the converging rays of light that comes after reflecting from objects.
- A real image is formed by actual convergence of light rays. Real images always form on a screen.
- A virtual image is the apparent convergence of diverging light rays. Virtual images cannot be obtained on a screen.

Image formation by plane mirror



Reflection

ACTIVITIES

1. Activity on Shadow Making

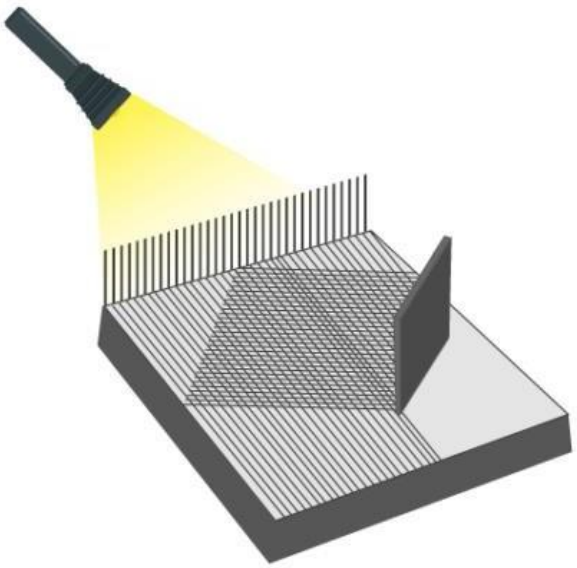
Try these Hand gestures on wall in front of light

2. TRANSFER OF LIGHT :-

Take a Torch and lit it on a glass, butter paper and a book respectively.

3. Image Formation by Plane Mirror :-

Take the example of a comb placed in front of a mirror over a dark coloured paper. Let a beam of light pass through the comb on the mirror using a torch. Then an image is observed similar to the one given.



KEY WORDS:

1. LUMINOUS - The objects that emit light. Examples: – Sun, Electric Bulb, torch, Stars

2. MIRROR - The mirror is the piece of glass that is metal-coated at one of the surfaces and reflects light from another surface.

3. OPAQUE - The objects that do not allow light to pass through them. Examples: – Wood, metal sheet, walls.

4. PINHOLE CAMERA - A camera that can be made by simple materials like boxes of cardboard, and used to see images of the sun and brightly lit objects. The pinhole camera does not have any lens, but an aperture or hole for light to get in.

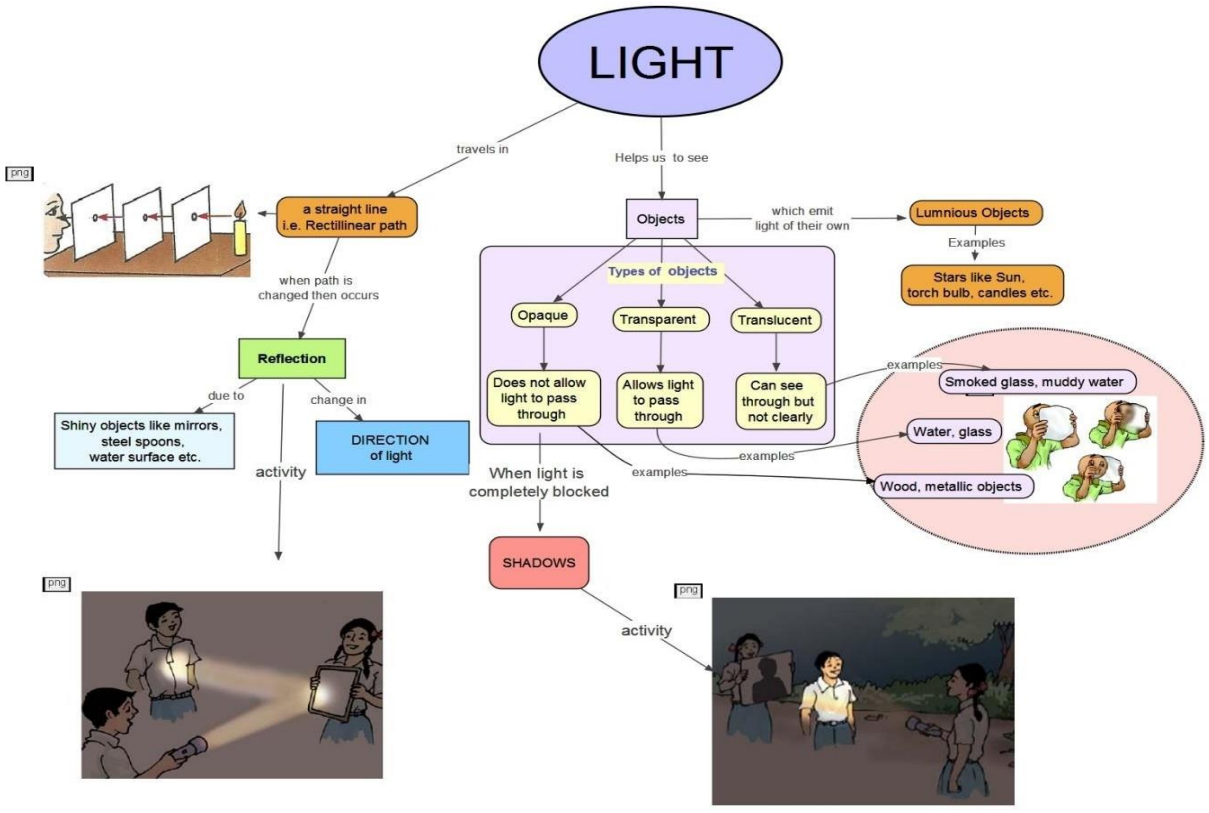
5. REFLECTION - The change in the direction of the light ray after falling on an object is called reflection.

6. SHADOW - When an opaque object comes in the path of the light ray it cast a shadow.

7. TRANSLUCENT - The objects that do not allow light to pass through them completely are called translucent objects. Only a partial amount of light appears to pass through them.

8. TRANSPARENT - The objects that allow light to completely pass through them.

MINDMAP



QUESTION BANK

MULTIPLE CHOICE QUESTIONS-

1. Light travels in –

(a) straight line

(b) curved line

(c) zig-zag line

(d) randomly

Ans- (a) straight line

2. When an opaque object comes in the path of light it forms

(a) an image with colours

(b) shadow

(c) black and white image

(d) depends on the colour of the light

Ans- (b) shadow

3. Which types of objects do not allow light to pass through them?

(a) Translucent

(b) Opaque

(c) Transparent

(d) Penumbra

Ans- (b) Opaque

4. Which is an example of a translucent object?

(a) A thin sheet of paper

(b) A thin glass slab

(c) A thin iron sheet

(d) All of these

Ans- (a) A thin sheet of paper

5. The ray of light that falls on a plane mirror is called

(a) reflected ray

(b) incident ray

(c) both (a) and (b)

(d) none of these

Ans- (b) incident ray

6. What is lateral inversion?

(a) Image becomes inverted

(b) Image bends laterally

(c) Right of the object appears left of the image

(d) All of these happen

Ans- (c) Right of the object appears left of the image

7. Which letters of English alphabet will not show lateral inversion?

(a) I, O, U

(b) N, Z, X

(c) I, X, E

(d) A, E, I

Ans- (a) I, O, U

8. Which is a device to image the sun?

(a) Plane mirror

(b) Pinhole camera

(c) A straight pipe

(d) Glass slab

Ans- (b) Pinhole camera

9. Which of the following is a cold source of light?

(a) Electric bulb

(b) Tube light

(c) The sun

(d) Firefly (Jugnu)

Ans- (d) Firefly (Jugnu)

10. Out of these, which one is not a man-made luminous body?

(a) Electric bulb

(b) Burning candle

(c) Firefly (Jugnu)

(d) Oil lamp

Ans- (c) Firefly (Jugnu)

VERY SHORT ANSWER TYPE QUESTIONS-

1. Whether the moon is luminous or non-luminous body?
Ans: Moon is non-luminous body.

2. What is umbra?

Ans: Umbra is the dark region behind object facing light which does not receive light at all.

3. How does a light ray travel?

Ans- Light ray travels in a straight line.

4. Give one natural source of light.

Ans: Sun is a natural source of light.

5. What is shadow?

Ans- Shadow is the dark space behind an opaque object where light does not reach.

6. What is penumbra?

Ans- The less darker shadow formed penumbra.on the periphery of dark shadow is called penumbra.

7. Name sources of light that are not hot.

Ans- Tube light and Jugnu

8. List any two man-made sources of Light

Ans- Bulb and Lamp

SHORT ANSWER TYPE QUESTIONS:-

1. State difference between a luminous and a non-luminous body.
Ans- The bodies which emit light are called luminous bodies. Example: sun, stars, burning candle etc. The bodies which does not emit light are called non-luminous bodies. Example: moon, earth, blackboard.

2. Why is the moon not considered as a luminous body?
Ans- Moon is non-luminous body because it shines by reflecting the sunlight falling on it.

3 What is an incandescent body? Give example.

Ans- The bodies which emit light when heated to a very high temperature are called incandescent bodies. Example: electric bulb.

4. When does a shadow form?
Ans- Shadow is formed when light does not reach behind the opaque object kept in the path of light.

5. What are the essential conditions for the formation of shadow?
Ans- (1) There should be an opaque material.
(2) There should be a source of light and screen.
(3) The object must be placed in the path of light.

6. Define reflection of light.
Ans- When light rays after striking the smooth and shiny surface return to same medium, this phenomenon is called reflection of light.

7. How will you convert a glass sheet into a translucent sheet?
Ans- There are following two methods to convert glass sheet into a translucent sheet:
(i) By smearing a thin layer of oil on glass sheet.
(ii) By covering a side of sheet by butter paper.

8. What is shadow? How does the colour of an opaque object affect the colour of the shadow?

Ans- A dark outline or patch formed by an opaque object that blocks light coming from a source of light is called shadow. The colour of an opaque object does not affect the colour of the shadow.

LONG ANSWER TYPE QUESTIONS

Q1. What are the different types of object based on their ability to pass the light? Give suitable examples of each objects.

Ans- On the basis of ability to pass light through an object, objects are classified into three main groups, i.e.,

- Transparent
- Translucent and
- Opaque.

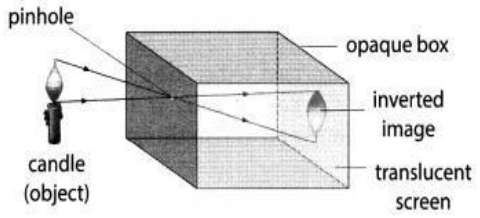
Transparent objects: Objects through which light can pass easily are called transparent objects, e.g., clean glass, clean water, clean air, etc.

Translucent objects: Objects through which light can pass partially and through which we cannot see clearly are called translucent objects, e.g., greased paper, wax paper, butter paper, etc.

Opaque objects: Objects through which light cannot pass at all and through which we cannot see are called opaque objects. Only opaque objects can make shadows, e.g., wall, blackboard, stone, etc.

Q2. What is a pinhole camera? How does it works? Explain its construction and image formation.

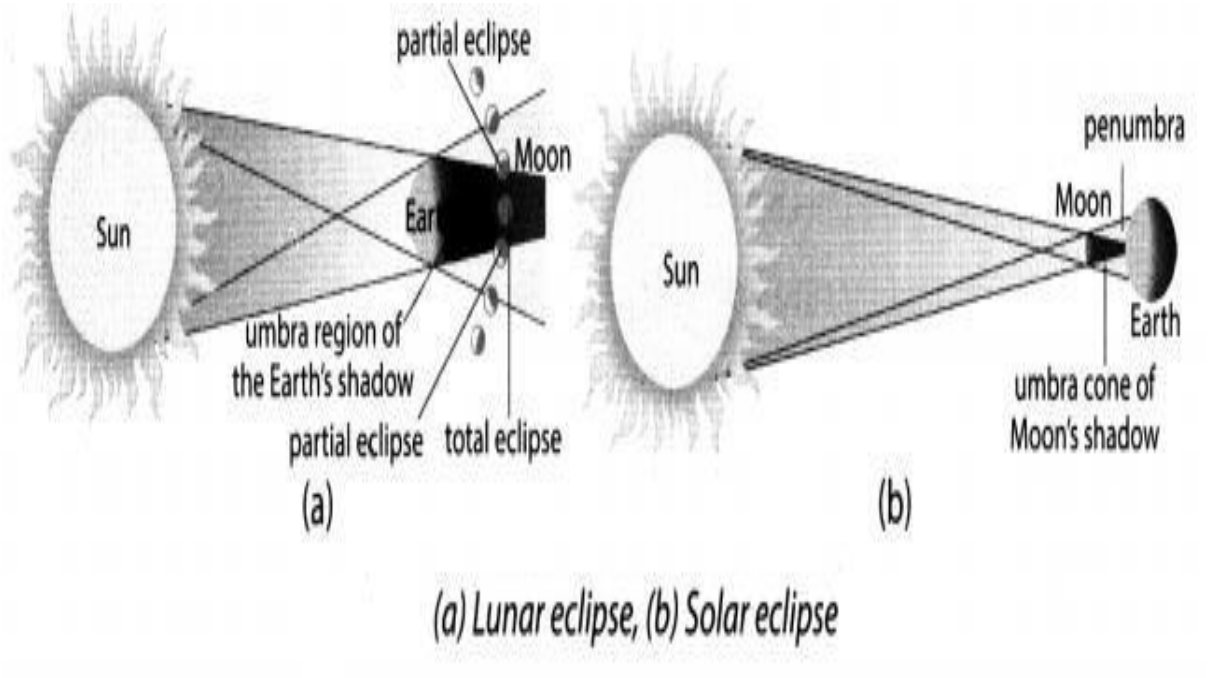
Ans- A pinhole camera is a device which casts a photographic image of a bright object on a screen. It works on the principle that light travels in a straight line. A pinhole camera can be made with simple materials and can be used to obtain the image of sun and brightly lit objects. It consists of a box made of metal or a cardboard that has a fine hole in one face. A plate or any translucent sheet on the side opposite to the face containing the pinhole sieves as a screen. Images formed by a pinhole camera are upside down, i.e., inverted images.



The image obtained in a pinhole camera is inverted

1. With the help of diagrams show solar and lunar eclipses.

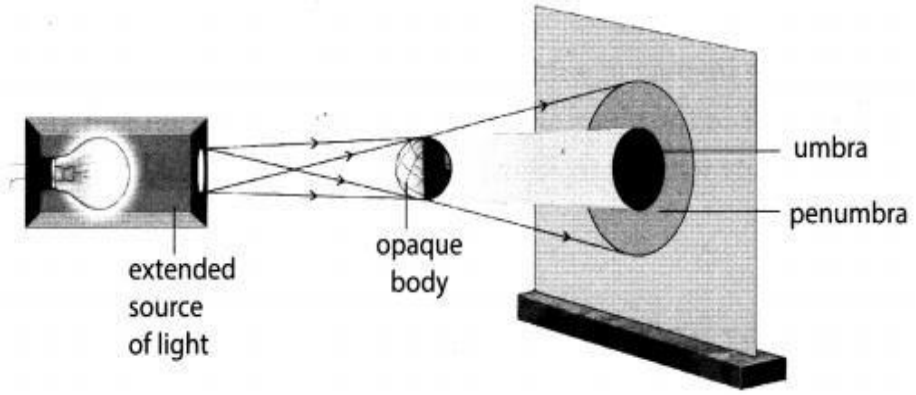
Ans-



(a) Lunar eclipse, (b) Solar eclipse

2. What is umbra and penumbra? With the help of a suitable diagram, show their formation.

Ans- The inner region of a shadow which is completely dark is called umbra and the outer region surrounding the umbra which is a partially dark region is called penumbra. These two regions in shadows are formed when an opaque body is placed in front of an extended or slit source.



Shadow formed by an extended source of light smaller than the object

CCT BASED QUESTIONS-

CASE-I

We see so many objects around us. On the way to school we see things like buses, cars, cycles, trees, animals and sometimes flowers. How do you think, we see objects? Think of the same places at night time if it were completely dark. What will you see? Suppose you go inside a completely dark room. Are you able to see any objects in the room? But, when you light a candle or a torch you can see the objects present in the room, isn't it? Without light, things cannot be seen. Light helps us see objects.

ANSWER THE FOLLOWING QUESTIONS-

1. What are Luminous objects ?

Ans- The objects which emit light of their own are called luminous objects.

2. Moon is a –

(a) Luminous object

(b) Non – Luminous Object

(c) both of these

(d) None of these

Ans- (b) Non – Luminous Object

3. Air is –

(a) Transparent

(b) Opaque

(c) Both of these

(d) None of these

Ans- (a) Transparent

CASE-II

A shadow is the 'region of the absence of light' caused by an object which does not allow light to pass. As light travels in a straight line, the light obstructed by the object causes a dark region with no light.

A shadow is formed in the presence of a light source.

Opaque and translucent objects which restrict the light to pass through them form a shadow, transparent objects do not produce a shadow.

ANSWER THE FOLLOWING QUESTIONS-

1. What is Shadow ?

Ans- When an opaque object comes in the path of the light ray it cast a shadow.

2. Which of the following will not form circular shadow ?

(a) Shoe Box

(b) A Ball

(c) A circular disc

(d) An ice cream cone

Ans- (a) Shoe Box

3. Rectilinear propagation of Light means –

(a) Light travels in straight path

(b) Light travels in curved path

(c) Light travels in circular path

(d) Light travels in zigzag path

Ans- (a) Light travels in straight path

NCERT Exercise Questions

1. Rearrange the boxes given below to make a sentence that helps us understand opaque objects.

OWS AKE OPAQ UEO BJEC. TSM SHAD

Solution:

OPAQ UEO BJEC TSM AKE SHAD OWS

2. Classify the objects or materials given below as opaque, transparent or translucent and luminous or non-luminous:

Air, water, a piece of rock, a sheet of aluminium, a mirror, a wooden board, a sheet of polythene, a CD, smoke, a sheet of plane glass, fog, a piece of red hot iron, an umbrella, a lighted fluorescent tube, a wall, a sheet of carbon paper, the fame of a gas burner, a sheet of cardboard, a lighted torch, a sheet of cellophane, a wire mesh, kerosene stove, sun, firefly, moon.

Solution:

OBJECT	OPAQUE	TRANSPARENT	TRANSLUCENT	LUMINOUS	NON-LUMINOUS
Air	—	✓	—	—	✓
Water	—	✓	—	—	✓
A piece of rock	✓	—	—	—	✓
A sheet of aluminium	✓	—	—	—	✓
A mirror	✓	—	—	—	✓
A wooden board	✓	—	—	—	✓
A sheet of polythene	—	—	✓	—	✓
A CD	✓	—	—	—	—
Smoke	—	—	✓	—	✓
A sheet of plane glass	—	✓	—	—	✓
Fog	—	—	✓	—	✓
A piece of red hot iron	✓	—	—	✓	✓
An umbrella	✓	—	—	—	✓
A lighted fluorescent tube	✓	—	—	✓	—
A wall	✓	—	—	—	✓
A sheet of carbon paper	✓	—	—	—	✓
The flame of a gas burner	✓	—	—	✓	—
A sheet of card board	✓	—	—	—	✓
A lighted torch	✓	—	—	✓	—
A sheet of cellophane	—	✓	—	—	✓
A wire mesh	—	—	—	—	✓
Kerosene stove	✓	—	—	✓	—
Sun	✓	—	—	✓	—
Fire fly	✓	—	—	✓	—
Moon	✓	—	—	—	✓

3. Can you think of creating a shape that would give a circular shadow if held in one way and a rectangular shadow if held in another way?

Solution : Yes, there are many things which give a circular shadow if held in one way and a rectangular shadow if held in another way. For example: a cylinder, a circular disc.

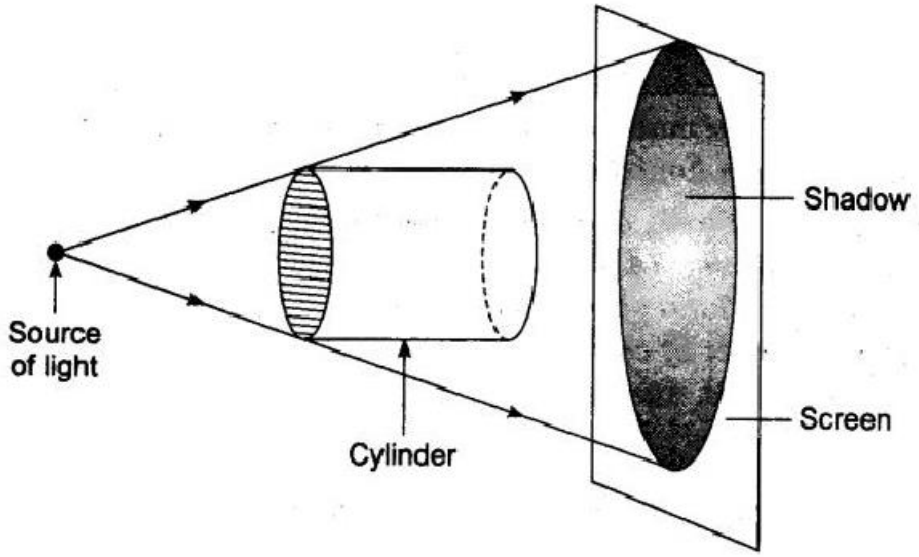


Fig. 11.9 (*a*) Getting circular shadow with a cylinder

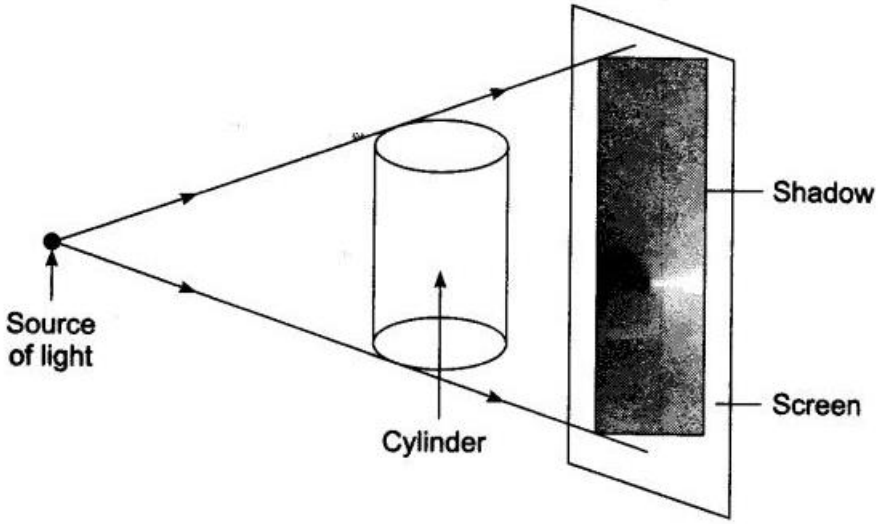


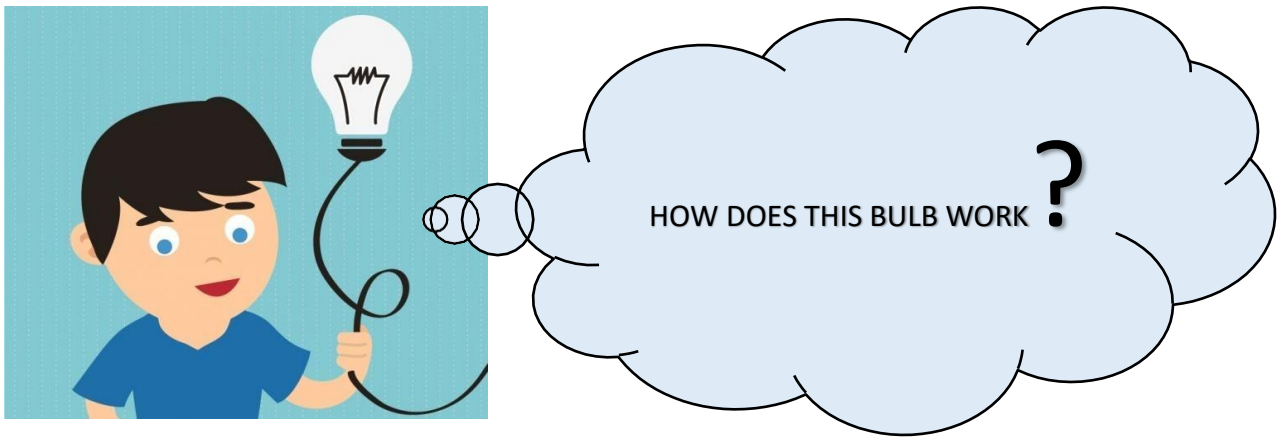
Fig. 11.9 (*b*) Getting a rectangular shadow with a cylinder.

4. In a completely dark room, if you hold up a mirror in front of you, will you see a reflection of yourself in the mirror?

Solution: No, in a completely dark room no image will be formed because there is no light in the room so no reflection of light takes place and no image will be formed.

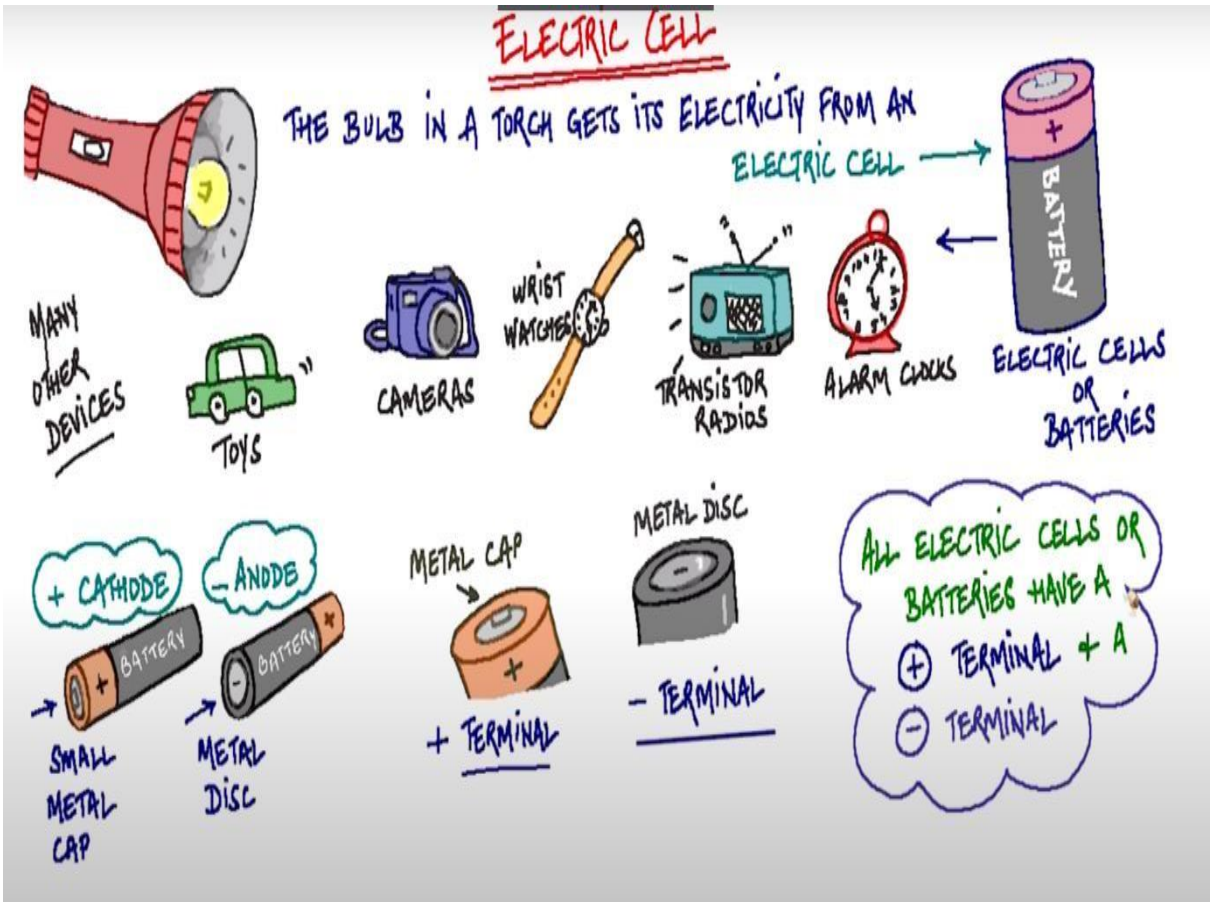
LESSON- 12

ELECTRICITY AND CIRCUITS



USES OF ELECTRICITY

1. It is used to light up homes, factories, roads etc.
2. It is used to run pumps.
3. It is used in many electrical appliances like toaster, geyser, radio, television, laptop, electric kettle etc.


ELECTRIC CELL
THE BULB IN A TORCH GETS ITS ELECTRICITY FROM AN ELECTRIC CELL
BATTERY
MANY OTHER DEVICES
TOYS
CAMERAS
WRIST WATCHES
TRANSISTOR RADIOS
ALARM CLOCKS
ELECTRIC CELLS OR BATTERIES
+ CATHODE
- ANODE
BATTERY
SMALL METAL CAP
METAL DISC
METAL CAP
+ TERMINAL
METAL DISC
- TERMINAL
ALL ELECTRIC CELLS OR BATTERIES HAVE A
+ TERMINAL & A
- TERMINAL


THERE ARE CHEMICALS
THAT HELP IT TO PRODUCE ELECTRICITY
WHEN THE CHEMICALS ARE USED UP THE CELL STOPS FUNCTIONING
YOUR TORCH DOESN'T LIGHT UP
YOUR TOY STOPS MOVING
YOU HAVE TO GET A NEW SET OF ELECTRIC CELLS!
THATS BECAUSE THE CHEMICALS IN THE BATTERIES HAVE BEEN USED UP

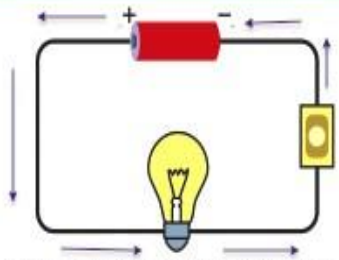
ELECTRIC BULB-

- The outer covering is glass and the base is metallic.
- The part of the bulb which glows is called **Filament** and is made up of tungsten.
- The filament is attached to two wires. One of the wires is connected to the metal case at the base and the other wire is connected to the metal wire at the centre of the base.

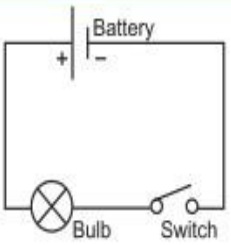
Base of the bulb and metal tip are the terminals of the bulb and they do not touch each other.

ELECTRIC CIRCUIT-

A closed path in which current flows is known as an Electric circuit. Electric circuit comprises of electrical components (e.g. cell or battery, bulb, switch, wire)



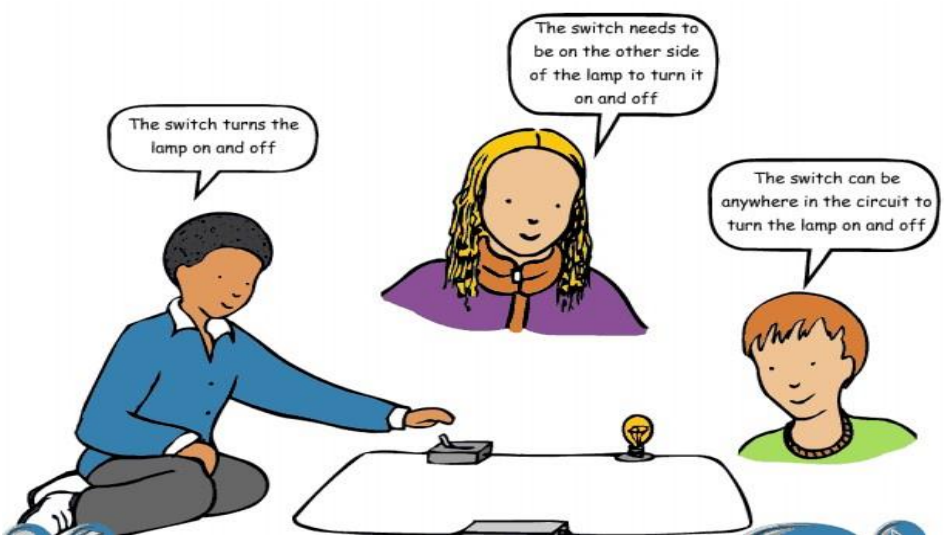
Circuit diagram with actual instruments



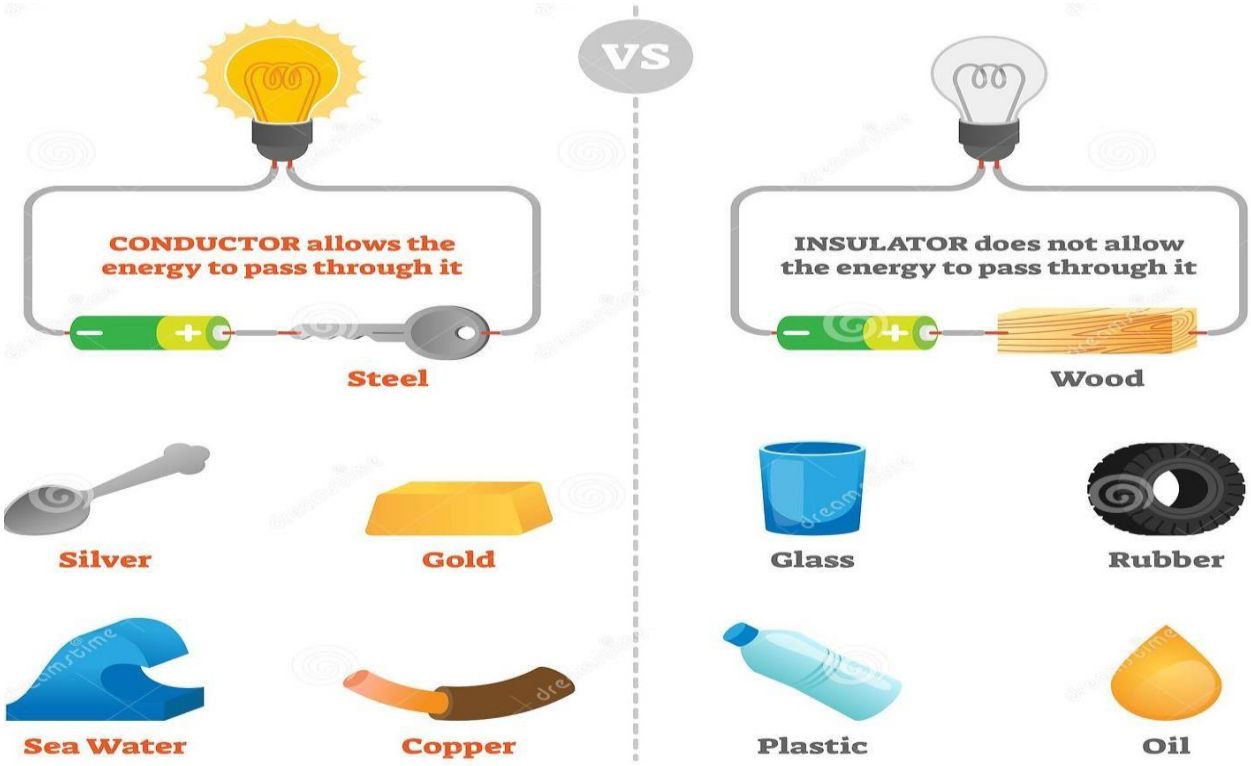
Circuit diagram with symbols

Direction of current: positive terminal of battery to its negative terminal

SWITCH -It is a simple device that either breaks the circuit or completes it.



CONDUCTORS AND INSULATORS:-



ACTIVITIES

1. **Filament of a Bulb :-**

Take a torch and look inside its bulb. You can also take out the bulb with the help of your teacher. What do you notice? Do you find a thin wire fixed in the middle of the glass bulb (in the figure below)? Now switch the torch on and observe which part of the bulb is glowing.

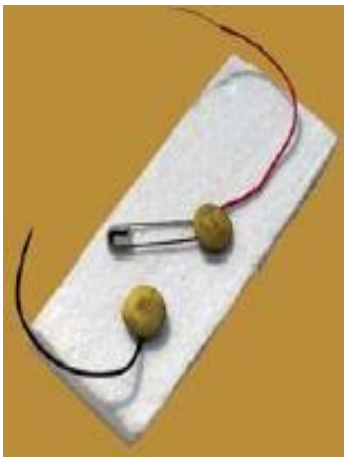
The thin wire that gives off light is called the **filament** of the bulb.

2. Electric Bulb :-

Take a torch bulb and a piece of wire. Remove the plastic covering at the two ends of the wire as you did before. Wrap one end of a wire around the base of an electric bulb as shown in the given figure. Fix the other end of the wire to the negative terminal of an electric cell with a rubber band. Now, bring the tip of the base of the bulb that is, its other terminal, in contact with the positive terminal of the cell. Does the bulb glow? Now move the bulb away from the terminal of the electric cell. Does the bulb remain lighted? Is this not similar to what you do when you switch your torch on or off?

3. Electric Switch :-

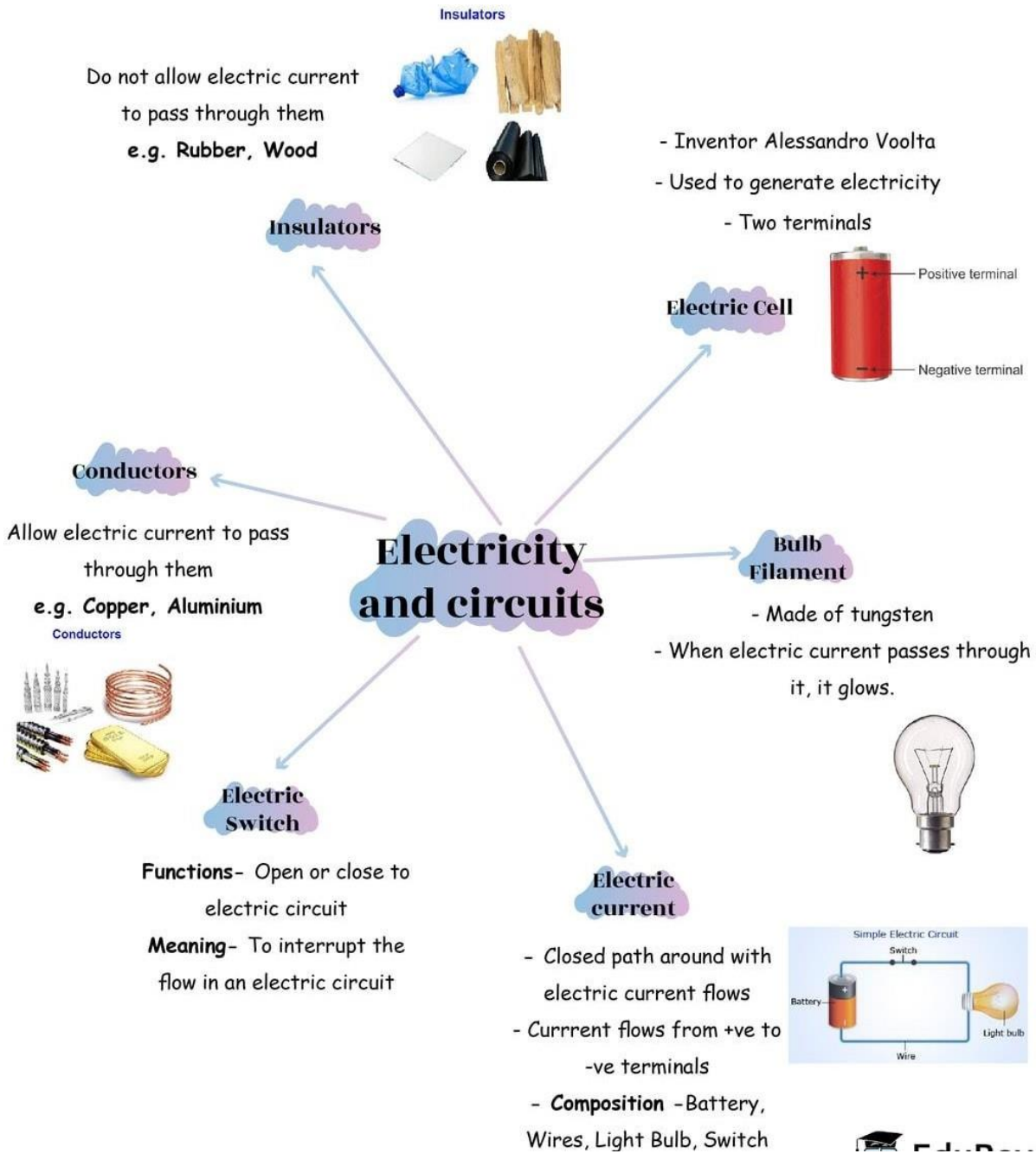
You can make a switch using two drawing pins, a safety pin (or a paper clip), two wires and a small sheet of thermocol or a wooden board. Insert a drawing pin into the ring at one end of the safety pin and fix it on the thermocol sheet as shown in the given figure. Make sure that the safety pin can be rotated freely. Now, fix the other drawing pin on the thermocol sheet in a way that the free end of the safety pin can touch it. The safety pin fixed in this way would be your switch in this activity.



KEY WORDS:

1. Electric cell: An electric cell is a source of electric current that contains a semi-solid ingredient.
2. Filament: a thin wire in the bulb which glows when current is passed through it.
3. Electric circuit: A path for an electric current to flow is called an electric circuit.
4. Electric switch: An electric switch is a device that is used to open or close a circuit.
5. Conductor: A material that allows electric current to pass through it is called a conductor.
6. A material that does not allow electric current to pass through it is called a insulator.

MINDMAP



QUESTION BANK

MULTIPLE CHOICE QUESTIONS-

1. A bulb has

(a) two terminals and two filaments
(b) two terminals and a filament
(c) multiple terminals and single filament
(d) single terminal and a filament

ANS- (b)

2. A bulb whose filament is broken is called
(a) fused
(b) glowing
(c) conductor
(d) none of these

ANS- (a)

3. The direction of flow of an electric current in a conducting wire is from:
(a) negative to positive
(b) positive to negative
(c) sometimes positive and sometimes negative.

ANS- (b)

4. Cell is a device which
(a) converts chemical energy into electrical energy
(b) electrical energy into light energy
(c) electrical energy into magnetic energy
(d) None of these

ANS- (a)

5. To prevent electric shocks, the metallic electrical wires are covered with
(a) paper
(b) cotton
(c) aluminium
(d) plastic

ANS- (d)

6. From where is electricity supplied to our homes?

(a) cell
(b) bulb
(c) power station
(d) candle

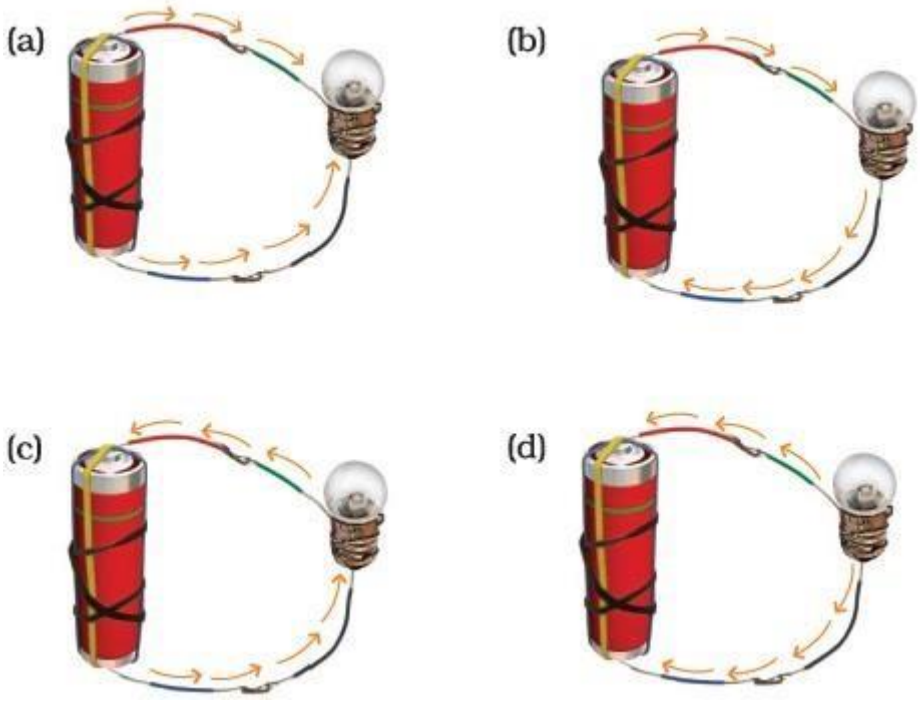
ANS- (c)

7. Which of the following is not a use of electricity?

(a) Riding bicycle
(b) Running pump
(c) Driving car
(d) Watching television

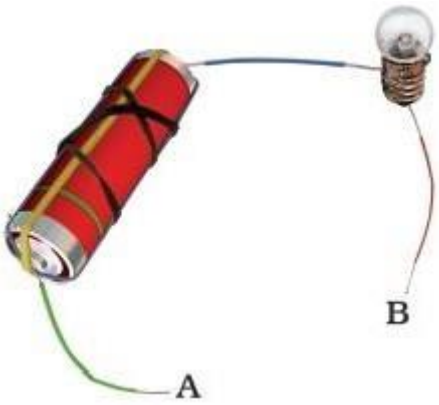
ANS- (a)

8. Choose from the options a, b, c and d given in the given figure which shows the correct direction of current.



ANS- (b)

9. In the following arrangement shown in the given figure, the bulb will not glow if the ends A and B are connected with



(a) A steel spoon

(b) A metal clip

(c) A plastic clip

(d) A copper wire

ANS- (c)

10. In which of the following circuits A, B and C given in the given figure the cell will be used up very rapidly?

ANS- (a)

VERY SHORT ANSWER TYPE QUESTIONS-

1. Name a good conductor of electricity which is not a metal.

Ans- Graphite

2. Name the material that glows inside the bulb.

Ans- Filament

3. What kind of cells are used in TV remotes?

Ans- Pencil cells

4. What is a cell?

Ans- It is a device that produces electricity.

5. Give two examples of insulators.

Ans- 1. Rubber

2. Plastic

6. How many terminals are there in a cell?

Ans- There are two terminals in a cell.

7. What is the main function of a switch?

Ans- Switch is a simple device that is used to either break the electrical circuit or to complete it.

8. Name some metals which are conductors.

Ans- Silver, copper, aluminium, etc.

SHORT ANSWER TYPE QUESTIONS:-

1. What is an electric cell?

Ans- A device which converts chemical energy into electrical energy.

2. What is meant by a battery?

Ans- When two or more cells are joined together, it is called a battery.

3. Give any difference between a cell and a battery.

Ans- A cell has only one plate as a positive and only one plate as a negative electrode, while a battery, which is a combination of cells in a series, can have many plates.

4. Why does a cell stop producing electricity after some time?

Ans- An electric cell produces electricity from chemicals stored inside it. When the chemicals inside the cell are used up, the cell stops producing electricity.

5. Name some devices in which we use an electric cell.

Ans- We use electric cell in an alarm clock, wrist watch, transistor, camera, torch, etc.

6. Why shouldn't the two terminals of an electric cell be joined directly?

Ans- Never join the two terminals of the electric cell without connecting them through a switch and a device like a bulb: Because the chemicals in the electric cell get used up very fast and the cell stops working.

7. Why rubbers and plastic used to cover electric wires and plug tops?

Ans- Rubbers and plastic are used to cover electric wires and plug tops because they are insulators and do not allow electric current to pass when we touch plugs and switches.

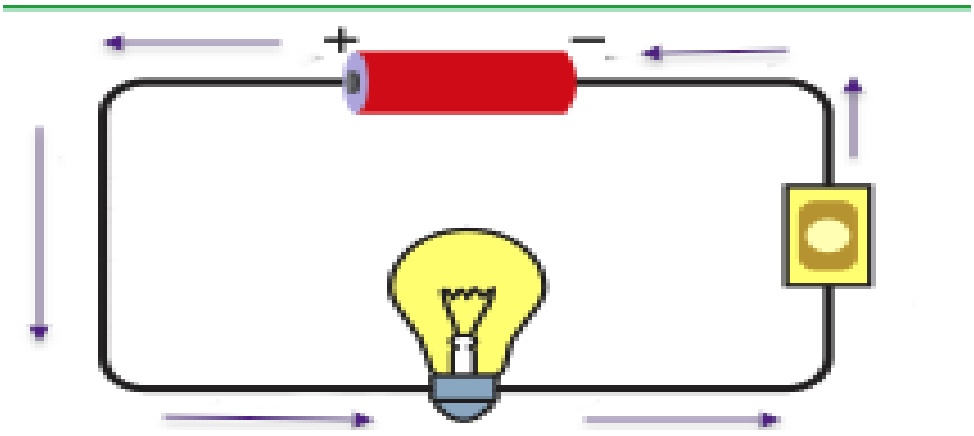
8. Why is distilled water used in the batteries and not the tap water?

Ans- Because distilled water acts as an insulator as it is purest water. Whereas tap water has salts and impurities and acts as a conductor.

LONG ANSWER TYPE QUESTIONS

1. Draw an electric circuit with a switch

Ans-



2. Think of six activities which use electric current. Also name the devices used to perform the activity.

	Activity you perform	Device
Example :	Get light	Torch
	_____	----------
	_____	----------
	_____	----------
	_____	----------
	_____	----------

Ans-

	ACTIVITIES	DEVICE
1.	Switch on television	remote
2.	play with remote control car	remote
3.	perform calculations	calculator
4.	clean floor	vacuum cleaner
5.	dry hair	hair dryer

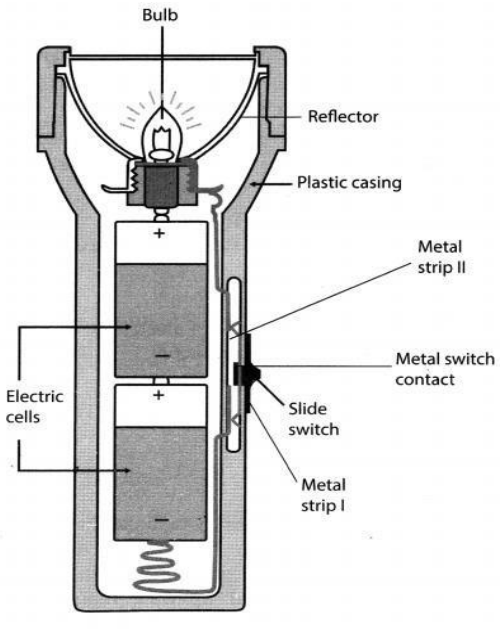
3. State any 5 uses of electricity.

Ans.

1. It is used to light up homes, factories, roads etc.
2. It is used to run pumps.
3. It is used in many electrical appliances like toaster, geyser, radio, television, laptop, electric kettle etc.
4. It is used in electric train
5. It is used to heat room etc.

4. Draw a well labelled diagram of a torch.

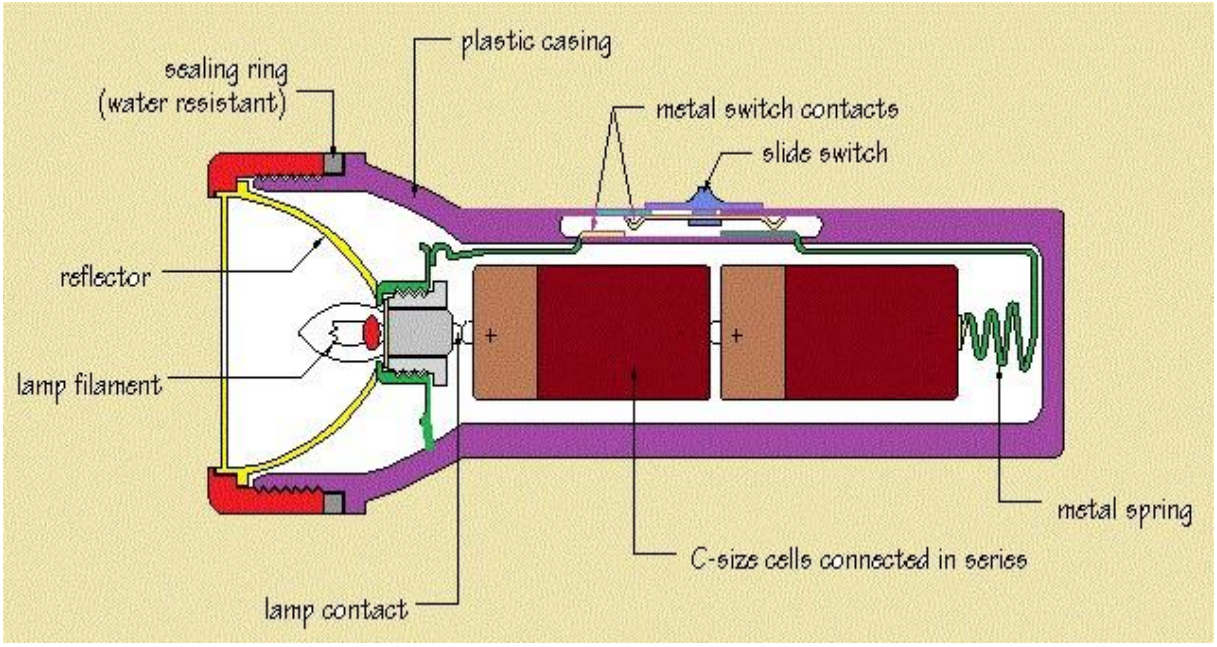
.Ans-



Inside view of a torch

CCT BASED QUESTIONS-

CASE-I



Answer the following questions with reference to the given figure

ANSWER THE FOLLOWING QUESTIONS-

1. If the two cells connected in above diagram are connected in opposite direction, will the torch bulb glow? Explain.

Ans- No, because current will not flow

2. As you can see in the figure that torch is covered with a plastic casing, why is it so?

Ans- Because plastic is an insulator.

3. Can we cover the torch by aluminium foil instead of plastic? Why or why not?

Ans- No, because aluminium is a conductor.

CASE-II

The given figures A and B, show a bulb connected to a cell in two different ways.

A

B

ANSWER THE FOLLOWING QUESTIONS-

1. What will be the direction of the current through the bulb in both the cases. (Q to P or P to Q)

Ans- in (A) Q to P and
in (B) P to Q

2. Does the brightness of the glowing bulb depend on the direction of current through it?

Ans- No

NCERT Exercise Questions

1. Fill in the blanks:

(a) A device that is used to break an electric circuit is called a_____.

(b) An electric cell has _____terminals.

Ans- (a) switch
(b) two

2. Mark 'True' or 'False' for the following statements:

(a) Electric current can flow through metals.

(b) Instead of metal wires, a jute string can be used to make a circuit.

(c) Electric current can pass through a sheet of thermocol.

Ans-

(a) True

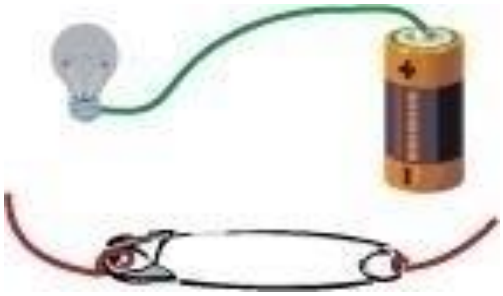
(b) False

(c) False

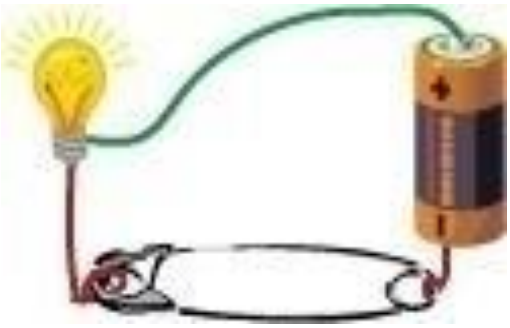
3. Explain why the bulb would not glow in the arrangement shown in Figure.

Ans- An electric current cannot pass through objects such as plastic scales, tester holders, etc., because these objects are bad conductors of electricity. From the given figure, it can be observed that one terminal of the bulb is connected to a tester holder. A current will not flow through the circuit. Hence, the bulb would not glow.

4. Complete the drawing shown in Figure to indicate where the free ends of the two wires should be joined to make the bulb glow.



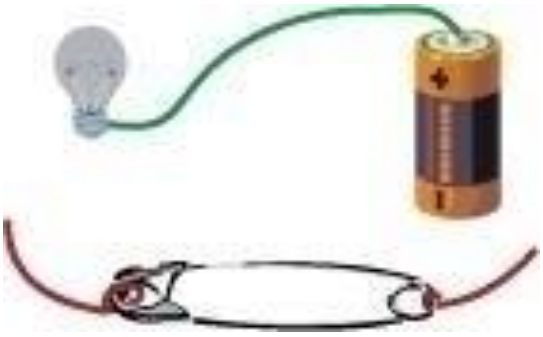
Ans- The given circuit is not complete. To complete the circuit, the positive terminal of the cell should be connected to one end of the switch, and the other terminal of the bulb should be connected to the other end of the switch. The closed circuit is shown in the following figure:



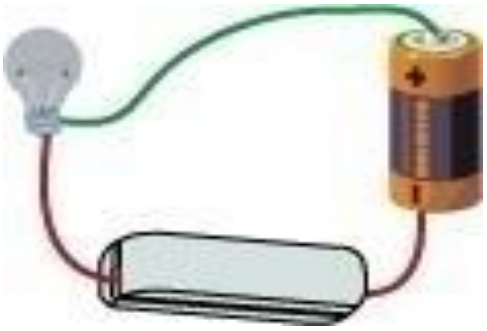
5. What is the purpose of using an electric switch? Name some electrical gadgets that have switches built into them.

Ans- A switch is an electric device that is used to complete or break an electric circuit. If the switch is ‘ON’, then a current can flow through the circuit. However, if the switch is ‘OFF’, then the current cannot flow through the circuit. Electrical appliances such as table fans, electric lamps, washing machines, juicers and mixers, TV, radio, etc. have switches built into them.

6. Would the bulb glow after completing the circuit shown in Figure, if we use an eraser instead of a safety pin?



Ans- Erasers are bad conductors of electricity. They do not conduct electricity. The circuit becomes an open circuit. Hence, the bulb will not glow if a safety pin is replaced with an eraser.



7. Would the bulb glow in the circuit shown in Figure?

Ans- The bulb will not glow. This is because the two terminals of the cell are connected to the single terminal of the bulb. This is equivalent to the bulb not being connected in the circuit at all. The two terminals of the battery should be connected to the two terminals of the cell.

8. Using the ‘conduction tester’ on an object, it was found that the bulb begins to glow. Is the object a conductor or an insulator? Explain.

Ans- When the two free ends of a conductor tester are touched with an object, then the bulb of the tester would glow if the object conducts electricity. However, the bulb would not glow if the object does not conduct electricity. Since the bulb glows when the tester is touched with the object, the object must conduct electricity. Hence, the object is a conductor.

9. Why should an electrician use rubber gloves while repairing an electric switch at your home? Explain.

Ans- An electric switch is an electrical appliance. It conducts electricity through its internal parts. When its internal parts are touched with naked hands, then it may cause an electric shock. Therefore, it should be touched with rubber gloves in hand because rubber cannot conduct electricity. Hence, electricians wear rubber gloves while repairing a switch or any other electrical appliance.

10. Handles of tools such as screwdrivers and pliers used by electricians for repair work usually have plastic or rubber cover on them. Can you explain why?

Ans- Rubber is a bad conductor of electricity. It does not allow current to flow through it. Hence, handles of tools such as screwdrivers, pliers, etc. which are used by electricians for repair work usually have plastic or rubber cover on them. This protects them from electric shocks.

LESSON- 13

FUN WITH MAGNETS

We use magnets in many ways in our day to day life. For example, to separate iron pieces from large pile of waste material, to stick favourite stickers on to doors of almirahs or refrigerators, in some pin holders, pencil boxes etc.

HOW MAGNETS WERE DISCOVERED?

A shepherd named Magnes who lived in Ancient Greece, used to take his herd of sheep and goats to the nearby mountains for grazing. He would take a stick with him to control his herd. The stick had a small piece of iron attached at one end.

One day he had to pull hard to free his stick from a rock on the mountainside. That rock attracted the iron tip of the shepherd's stick. This was the discovery of natural magnets. Such rocks were called magnetite after the name of shepherd.

SHEPHERD MAGNES FOUND NATURAL MAGNET ON HILLSIDE

Magnetite contains iron. Some people also believe that magnetite was first discovered at a place called Magnesia. The substances having the property of attracting iron are now known as magnets.

MAGNET:-

Magnet is a material which attracts materials like iron, cobalt, nickel etc.

TYPES OF MAGNETS -

There are two main types of magnets. They are natural magnets and artificial magnets.

i) Natural magnet: - is magnet got from rocks called magnetite. It contains iron.

ii) Artificial magnet: - is magnet made from iron, cobalt and nickel.




MAGNETIC AND NON MAGNETIC MATERIALS :-

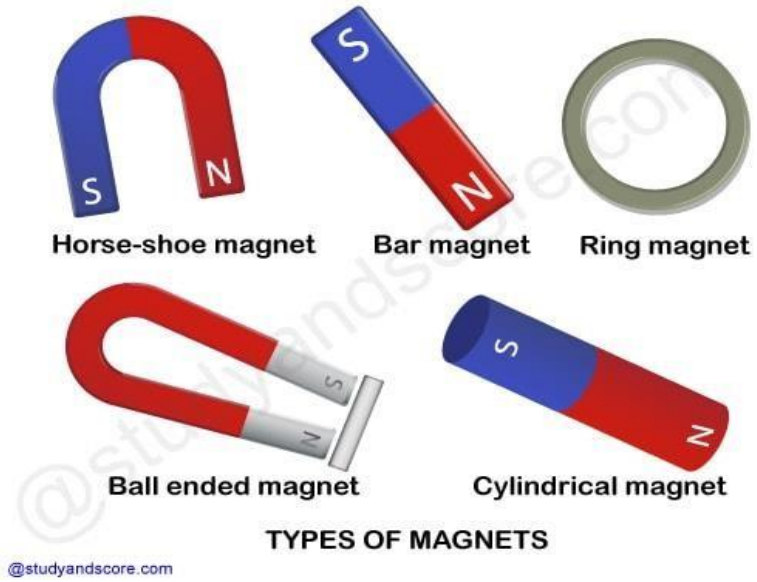
a) Magnetic materials :- are materials which are attracted by magnets. e.g.:- iron, cobalt, nickel, steel etc.

b) Non-magnetic materials :- are materials which are not attracted by magnets. e.g.:- wood, plastic, rubber, glass etc.



SHAPES OF MAGNETS :-

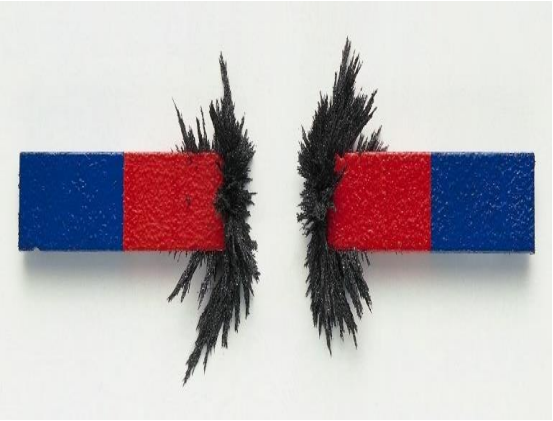
Magnets are of different shapes. They are bar magnet, horse shoe magnet, cylindrical magnet etc.

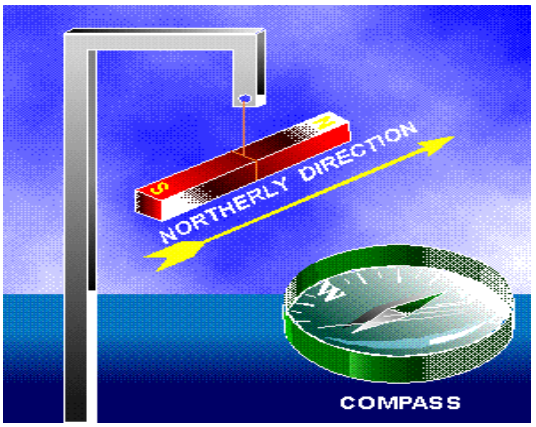


POLES OF A MAGNET :-

The two ends of a magnet where the attraction is maximum are called the poles of the magnet. A magnet has two poles called North Pole and South Pole.

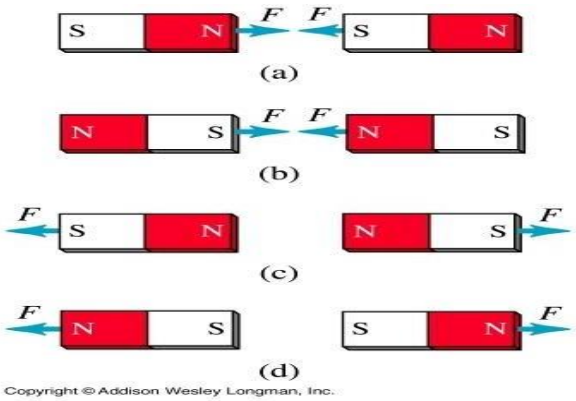
A freely suspended bar magnet points in the North – South direction. The end of the magnet which points towards the north is called the North Pole and the end of the magnet which points towards the south is called the South Pole.

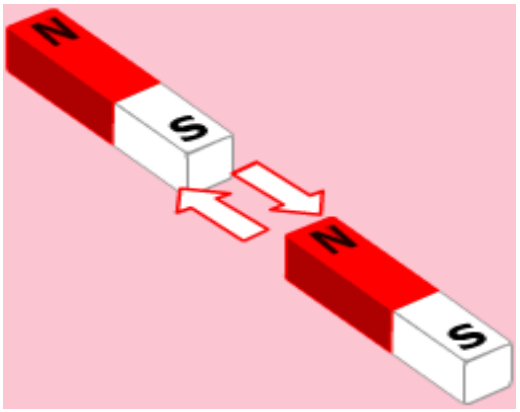




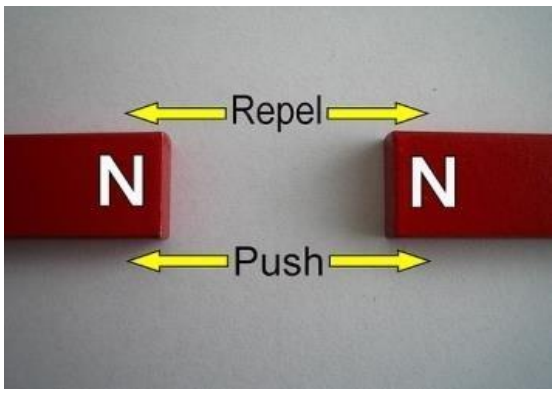
ATTRACTION AND REPULSION BETWEEN MAGNETS :-

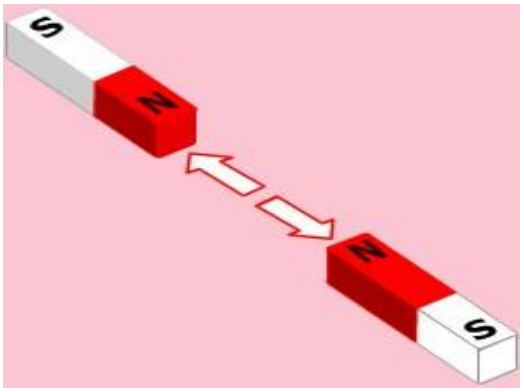
i) The opposite poles of two magnets attract each other.





ii) The similar poles of two magnets repel each other.



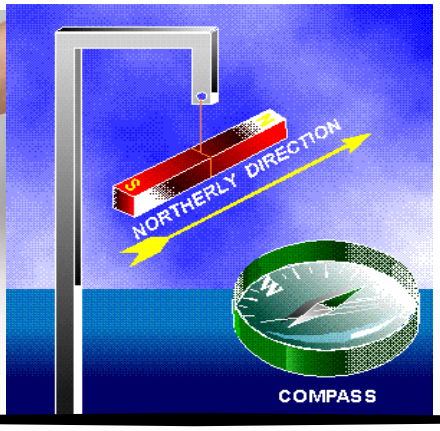


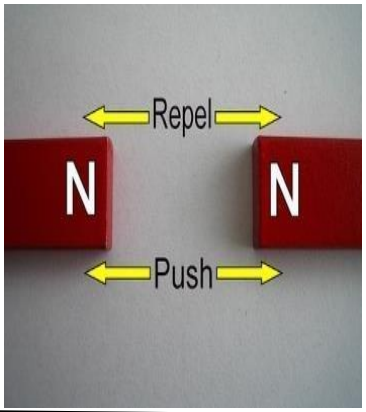
PROPERTIES OF MAGNETS :-

i) Magnets attract materials like iron, cobalt, nickel etc.

ii) A freely suspended magnet points in the north – south direction.

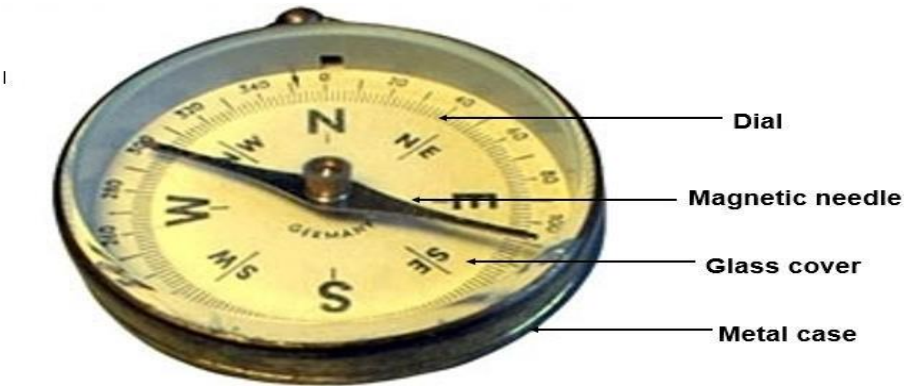
iii) The opposite poles of two magnets attract each other and the similar poles of two magnets repel each other.





MAGNETIC COMPASS :-

A magnetic compass is a device used to find directions. It has a metal case with a glass cover. A magnetic needle which can rotate freely is pivoted inside the case. It also has a dial marked with directions inside it.

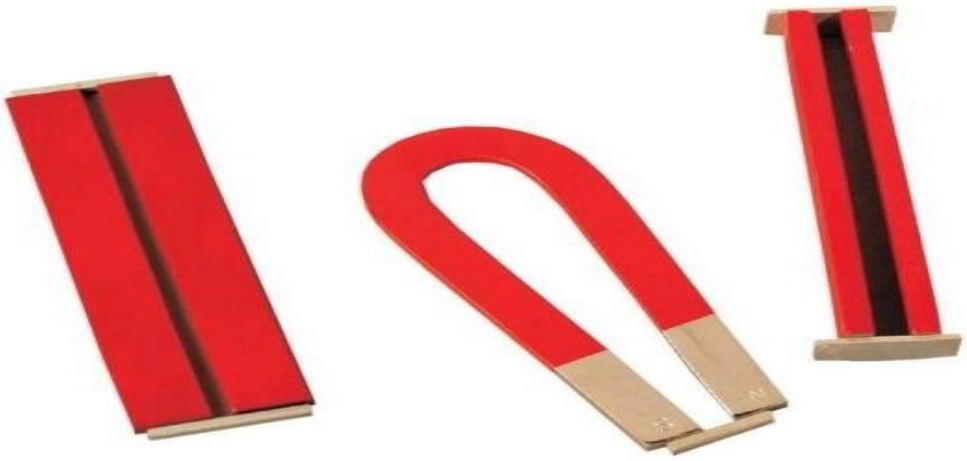


A FEW CAUTIONS ABOUT MAGNETS :-

i) Magnets lose their properties if they are heated, hammered or dropped from a height.

ii) Magnets should be stored properly. Bar magnets should be kept in pairs with their opposite poles on the same side. They should be separated by a piece of wood and two pieces of soft iron should be placed at the two ends. For a horse shoe magnet a piece of soft iron should be kept across the poles.

iii) Magnets should be kept away from radio, television, music systems, computers, mobile phones, cassettes, compact discs etc.



ACTIVITIES

1. THE STRENGTH OF THE MAGNET IS MORE AT THE POLES OF THE MAGNET:-

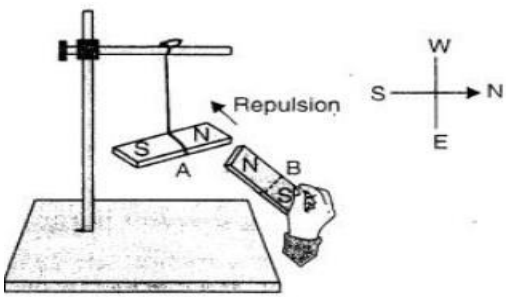
Take some iron pins or iron filings and put them on a paper. Roll a bar over them. You will observe that maximum iron pins or filings stick to the ends (poles) of the magnet this shows that the strength of the magnet is more at the poles of the magnet.

2. TO PROVE THAT LIKE POLES REPEL WHILE UNLIKE POLES ATTRACT EACH OTHER:-

Suspend a bar magnet, whose poles are marked, with a thread on a wooden stand. It will come to rest in the north-south direction. Take another bar magnet in your hand whose poles are also marked. Bring the north pole of this magnet close to the north pole of the suspended magnet. You will observe that the north pole of the suspended magnet turns away from the north pole of the magnet that you are holding in your hand.

Next, bring the south pole of the magnet in your hand close to the north pole of the suspended magnet. The north pole of the suspended magnet gets attracted towards it.

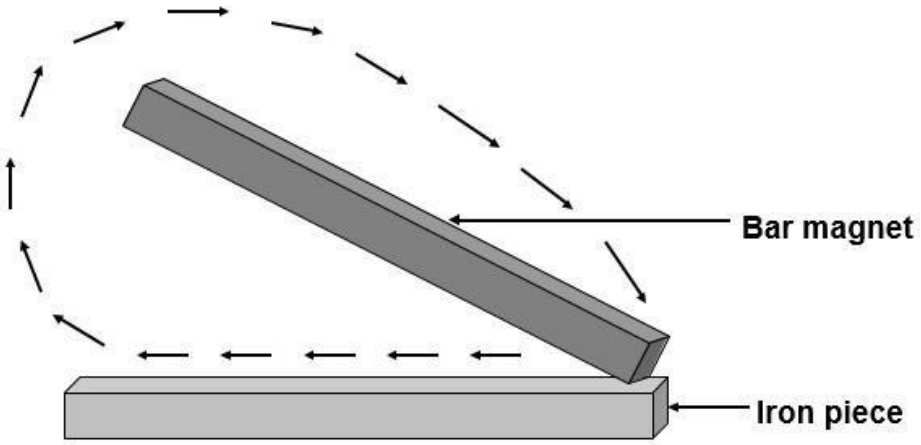
This proves that like poles repel and unlike poles attract each other.



Like poles repel each other

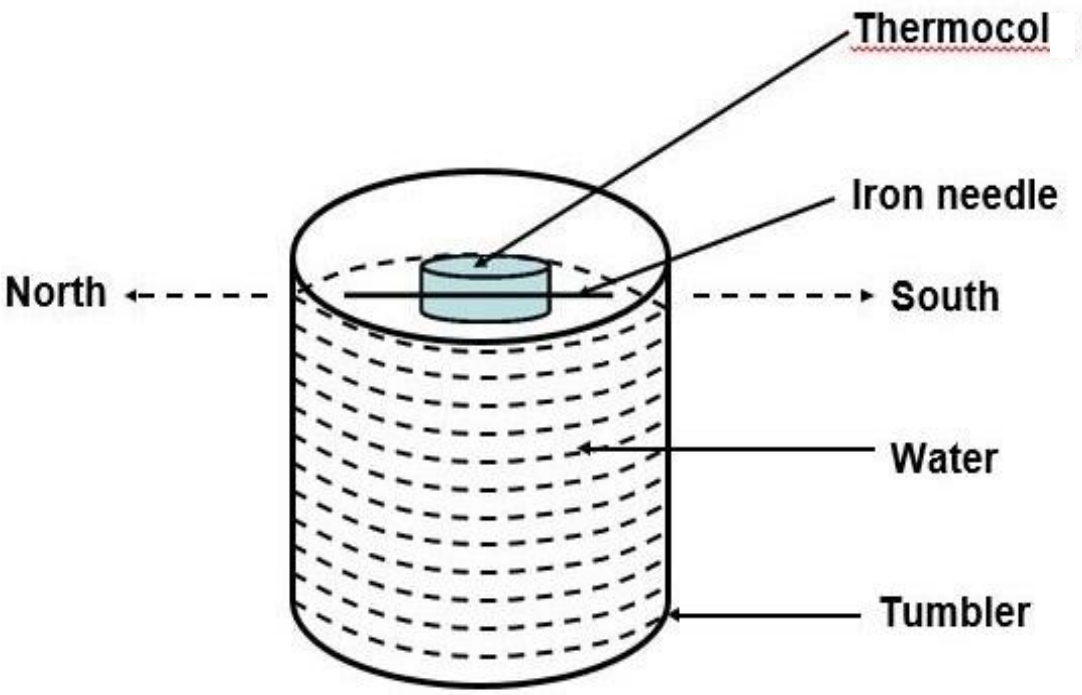
3. HOW TO MAKE A MAGNET :-

Take a rectangular piece of iron, a needle, a blade or an iron nail. Keep it on a table. Take a bar magnet and keep one of its pole on one end of the piece of iron. Move it along the piece of iron till the other end. Then lift the magnet and repeat this process 30 to 40 times. Then the piece of Iron becomes a magnet.



4. HOW TO MAKE A MAGNETIC COMPASS:-

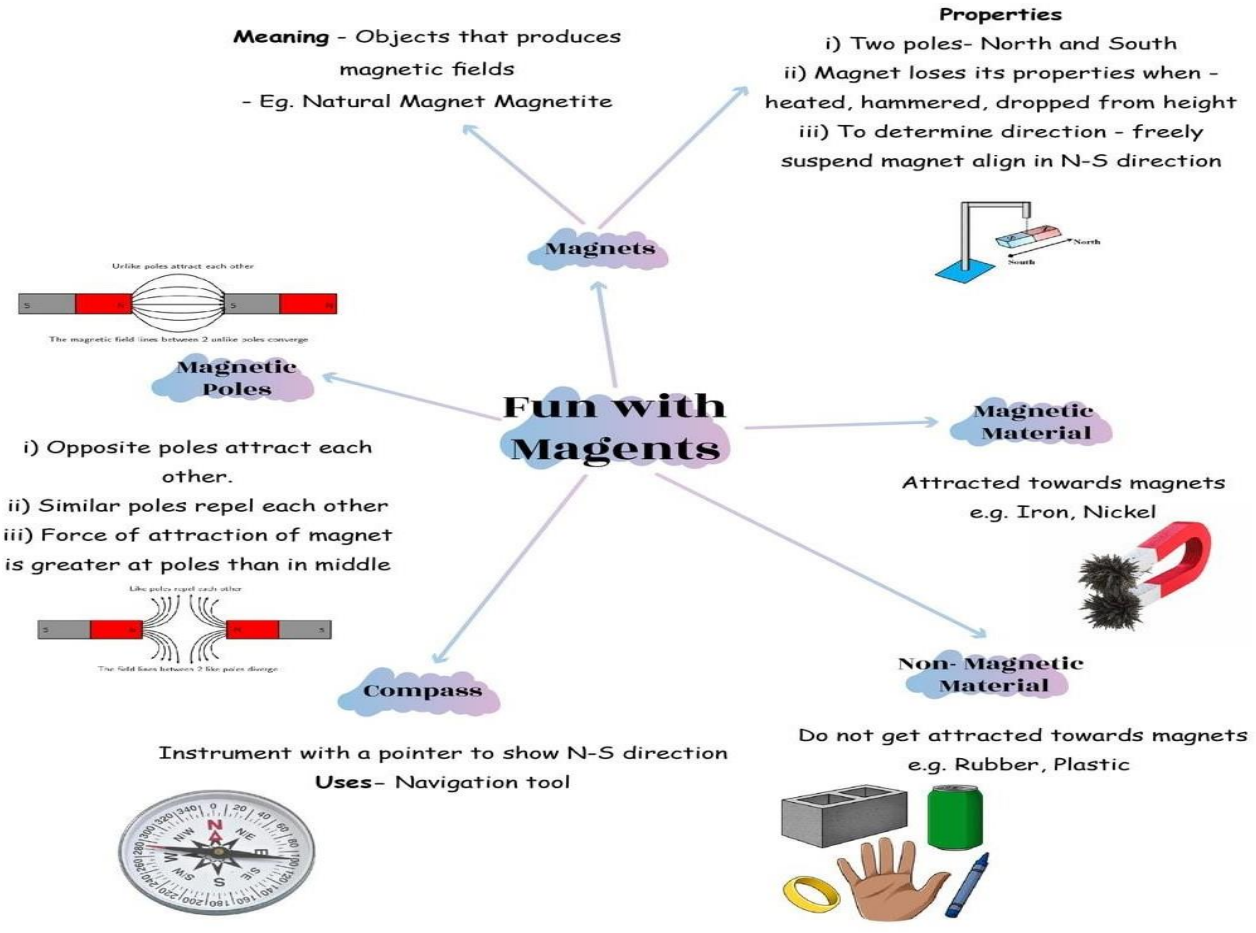
Magnetise an iron needle with a bar magnet. Insert the needle through a piece of thermocol float it in a cup of water. The needle points in the North – South direction.



KEY WORDS:

1. COMPASS- An instrument which is used to find the directions.
2. MAGNET- A material that attracts objects made of Iron, Nickel, and Cobalt.
3. MAGNETITE- It is a natural magnet.
4. MAGNETIC MATERIALS- Materials that are attracted to magnets.
5. NON MAGNETIC MATERIALS- Materials that are not attracted to magnet.
6. MAGNETIC FORCE- The force exerted by a magnet on magnetic materials in its magnetic field.
7. MAGNETIC POLES- The two ends of a magnet where the attraction is maximum are called the poles of the magnet. A magnet has two poles called North Pole and South Pole.
8. DEMAGNETISE- The tendency to lose magnetism and magnetic properties.

MINDMAP



QUESTION BANK

MULTIPLE CHOICE QUESTIONS-

1. Which of the following is a natural magnet?

(a) Lodestone

(b) Bar magnet

(c) Ball-ended magnet

(d) Horse-shoe magnet

Ans- (a) Lodestone

2. Which of the following is an artificial magnet?

(a) Bar magnet

(b) Horse-shoe magnet

(c) Disc shaped magnet

(d) All of these

Ans- (d) All of these

3. Which of the following is a magnetic material?

(a) Paper

(b) Iron

(c) Wood

(d) Stone

Ans- (b) Iron

4. Which of the following is a non-magnetic material?

(a) Iron

(b) Cobalt

(c) Glass

(d) Nickel

Ans- (c) Glass

5. A bar magnet is immersed in a heap of iron filings and pulled out. The amount of iron filing clinging to the-

(a) North pole is almost equal to the South Pole.

(b) North pole is much more than the South Pole.

(c) North pole is much less than the South Pole

(d) Magnet will be same all along its length

Ans- (a) North Pole is almost equal to the South Pole.

6. A freely-suspended bar magnet rests in:

(a) north-south direction

(b) east-west direction

(c) north-east direction

(d) Any direction by chance

Ans- (a) north-south direction

7. The two ends of the magnet are called-

(a) Poles

(b) Strength

(c) North

(d) South

Ans- (a) Poles

8. Attraction is maximum at the-

(a) Centre

(b) Poles

(c) Both (a) and (b)

(d) None of these

Ans- (b) Poles

9. The magnets which lose their property of magnetism after a short period of time are called-

(a) Permanent magnets

(b) Temporary magnets

(c) Natural magnets

(d) Lodestones

Ans- (b) Temporary magnets

10. The magnetic properties of a magnet can be destroyed by-

(a) Hammering

(b) Heating

(c) Dropping

(d) All of these

Ans- (d) All of these

VERY SHORT ANSWER TYPE QUESTIONS-

1. Name the country in which magnet was discovered?

Ans- Greece

2. Name the first magnet.

Ans- Lodestone.

3. What are magnetic materials?

Ans- Materials which get attracted by the magnet are called magnetic materials.

4. What are non-magnetic materials?

Ans- Substances which are not attracted by the magnet are called non-magnetic materials.

5. Write the names of some non-magnetic substances

Ans- Rubber, Cotton, Plastic, Wood, Button, Cloth, etc.

6. What is lodestone?

Ans- A Lodestone is naturally magnetised piece of mineral Magnetite.

7. Name two magnetic materials

Ans- Iron and Cobalt

8. How many poles are there in a magnet?

Ans- Two

9. Name the shepherd after which magnet was named?

Ans- Magnes.

10. In which direction does a suspended magnet come to rest?

Ans- North-South direction.

SHORT ANSWER TYPE QUESTIONS:-

1. What is a magnet? Mention their classification.

Ans- A magnet is a substance that has the property of attracting objects made of iron, cobalt and nickel. On the basis of their occurrence, the magnets can be classified as-

(a) Natural magnets
(b) Artificial magnet

2. What are magnetic materials? Explain with examples.

Ans- Magnetic materials are those materials which get attracted to magnets. For example, materials made of metals as iron, nickel, cobalt, etc.

3. What are non-magnetic materials? Explain with examples.

Ans- Non-magnetic materials are those materials that do not get attracted to magnets. For example, paper, wood, plastics, etc.

4. What are properties of magnets?

Ans-1) It attracts objects made of Nickel, Cobalt and Iron.
2) Like poles of two magnets repel each other and opposite poles attracts each other.
3) It always align itself in north-south direction.

5. Write main properties of a magnet.

Ans-
1. Magnet has two poles-south pole and North Pole.
2. Poles of magnet can-not be isolated
3. Like poles repel each other and unlike poles attract each other.
4. Freely suspended magnet align in N-S direction.

6. What are permanent magnets?
Ans- The magnets that do not lose their property of magnetism even after a long period of time are called permanent magnets.

7. What are temporary magnets?
Ans- There are some magnets that lose their property of magnetism after a short period of time. These are called as temporary magnets.

8. What is magnetic field?
Ans- The area around a magnet where its effect can be felt is known as magnetic field. It is more at the poles.

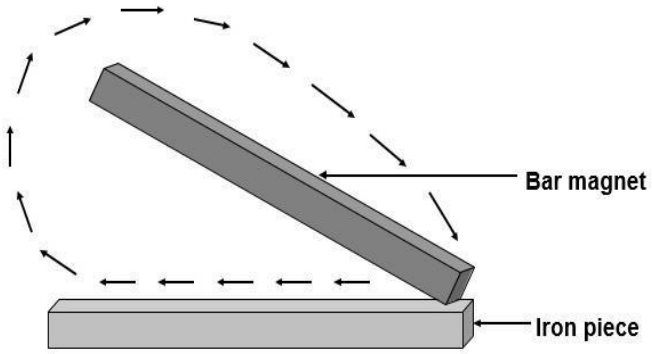
9. Can we isolate North Pole or South Pole of a magnet? Give reason.
Ans- No, we cannot isolate North Pole of a magnet from its South Pole or vice-versa. If we break a bar magnet into two halves, we will not get a single north or south pole but two magnets each with its north and south poles.

10. What are the ways by which a magnet can be demagnetised?
Ans- Ways by which a magnet can be demagnetised are:
1. Throwing or dropping the magnet from a height
2. Heating the magnet.
3. Hammering the magnet.
4. Improper storing

LONG ANSWER TYPE QUESTIONS

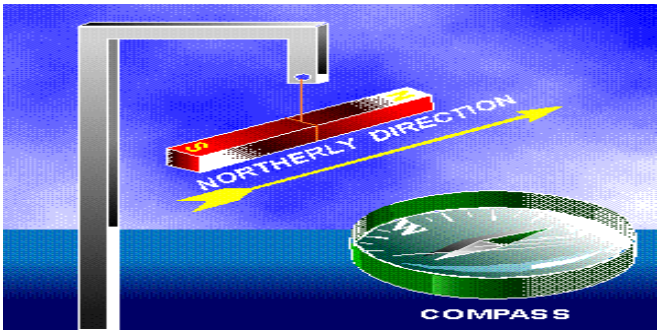
1. How can you make an iron strip into a magnet?

Ans- Take a bar magnet and place its pole near one edge of the iron bar. Without lifting the bar magnet move it along the length of iron bar. Move the magnet again along the iron bar. Repeat it 30-40 times. Check whether it has become a magnet. If not continue the process for the some more time.



2. How was magnet discovered?
Ans- It is said that magnet was discovered in Greece. A shepherd name magnes used to take a stick with him to control his heard. One day he was surprised to see that he had to pull hard to free his stick from the rock on the mountain-side. The rock was natural magnet and it attracted iron tip of shepherd's stick.

3. Why does bar magnet always point in north-south direction?
Ans- Bar magnet always points in north-south directions when left freely suspended because earth itself behaves like a magnet and north pole of bar magnet is attracted towards south pole of earth's magnet and vice-versa.



4. Few iron nails and screws got mixed with the wooden shaving while a carpenter was working with them. How can you help him in getting the nails and screws back from the scrap without wasting his time in searching with his hands?
Ans- With the help of a magnet we can attract all iron nails and screws and can separate them from the wooden shavings. An iron nails and screws are magnetic materials and will get attracted to the magnet, whereas wooden shavings are non-magnetic.

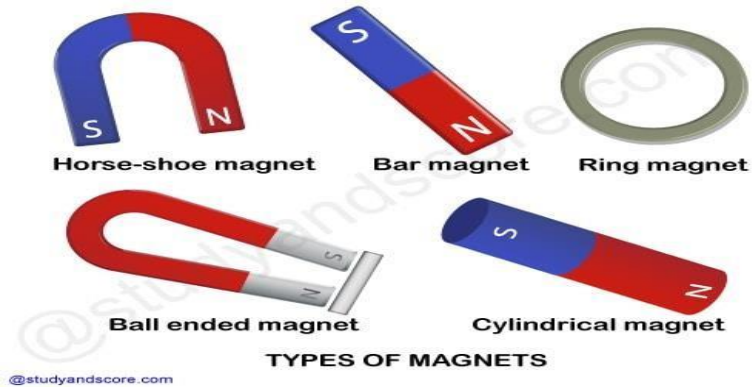
5. Show that a magnet has two poles. What are the properties of the poles of a magnet?
Ans- We know that pole is the point where the strength of the magnet is maximum. So more and more iron particles will be attracted at poles of a magnet when we bring a magnet near the iron particles. We will observe the crowdedness of particles at the ends of magnet. This indicates the presence of two poles in a magnet. Hence poles are present in a magnet in pairs. If a magnet is divided into two parts, each part also possesses a pair of poles.

CCT BASED QUESTIONS-

CASE-I

A magnet is an object which attracts things made of Iron, steel, nickel and cobalt. Magnets are made of Iron, steel or other alloys of iron by the process of magnetisation. Magnets are made in different shapes and sizes so that they can be used for different purposes. A bar magnet is a long rectangular magnetised bar of iron or steel.

Some of the other types of magnets are horse-shoe magnet, U shaped magnet, cylindrical magnet and ring magnet.



ANSWER THE FOLLOWING QUESTIONS-

1. The number of poles in a magnet are-

(a) 2

(b) 3

(c) 4

(d) 6

Ans- (a) 2

2. Which is/are the examples of a magnetic substances

(a) Iron

(b) Copper

(c) Nickel

(d) All of the above

Ans- (d) All of the above

3. Which is a natural magnet?

(a) Haematite

(b) Magnetite

(c) Bakelite

(d) Copper

Ans- (b) Magnetite

4. A substance which retains its magnetic properties for a long period is called a -----.

(a) Magnetic substance

(b) Non- magnetic substance

(c) Temporary magnet

(d) Permanent magnet

Ans- (d) Permanent Magnet

5. The poles of the magnet that will attract each other are-

(a) north-north

(b) north-south

(c) south-south

(d) all of them

Ans- (b) north-south

CASE-II

A freely suspended magnet always align itself in the north-south direction because the earth itself behaves as a huge bar magnet. Magnetic poles of the earth are near the geographical North and South poles of the earth. The south pole of the bar magnet is near the geographical north pole, while the north pole of the magnet is near the geographical south pole.

ANSWER THE FOLLOWING QUESTIONS-

1. A magnet that is freely suspended will always align itself in the

(a) North-west direction

(b) East-west direction

(c) North-south direction

(d) South-west direction

Ans- (c) North-south direction

2. When a bar magnet is rolled over iron filings stick to the-

(a) south pole

(b) north pole

(c) in the middle

(d) Both (a) and (b)

Ans- (d) Both (a) and (b)

3. In order to retain the magnetic properties of a bar magnet it should not be-

(a) Hammered

(b) Heated

(c) Dropped from the height

(d) All of these

Ans- (d) All of these

4. The north pole of the earth's magnet is near the geographical_____.

(a) West

(b) East

(c) South

(d) North

Ans- (c) South

5. A magnet is not used in a/an-

(a) Audio-tape

(b) Video-tape

(c) ATM card

(d) Stapler

Ans- (d) Stapler

NCERT Exercises

1. Fill in the blanks in the following

(i) Artificial magnets are made in different shapes such as_____,_____ and_____.

(ii) The Materials which are attracted towards a magnet are called_____.

(iii) Paper is not a_____material.

(iv) In olden days, sailors used to find direction by suspending a piece of _____.

(v) A magnet always has_____poles.

Solution:

(i) Artificial magnets are made in different shapes such as bar magnet, horse shoe and cylindrical.

(ii) The Materials which are attracted towards a magnet are called **magnetic.**

(iii) Paper is not a **magnetic** material.

(iv) In olden days, sailors used to find direction by suspending a piece of **magnet**.

(v) A magnet always has **two** poles.

2. State whether the following statements are true or false:

(i) A cylindrical magnet has only one pole.

(ii) Artificial magnets were discovered in Greece.

(iii) Similar poles of a magnet repel each other.

(iv) Maximum iron filings stick in the middle of a bar magnet when it is brought near them.

(v) Bar magnets always point towards North-South direction.

(vi) A compass can be used to find East-West direction at any place.

(vii) Rubber is a magnetic material.

Solution:

i) False

ii) False

iii) True

iv) False

v) True (Freely suspended bar magnet)

vi) True

vii) False

3. It was observed that a pencil sharpener gets attracted by both the poles of a magnet although its body is made of plastic. Name a material that might have been used to make some part of it.

Solution: In a pencil sharpener, the blade is made of iron and when it comes in contact with magnet, iron is attracted by the magnet.

4. Column I shows different positions in which one pole of a magnet is placed near that of the other. Column II indicates the resulting action between them for each situation. Fill in the blanks.

Column – I	Column – II
N-N	_____
N-___	Attraction
S-N	_____
___-S	Repulsion

Solution:

Column – I	Column – II
N-N	Repulsion
N- S	Attraction
S-N	Attraction
S-S	Repulsion

5. Write any two properties of a magnet.

Solution: Properties of a magnet are as follows

- It attracts objects made of Nickel, Cobalt and Iron.
- Like poles of two magnets repel each other and opposite poles attracts each other.

6. Where are poles of a bar magnet located?

Solution: At two ends of a bar magnet.

7. A bar magnet has no markings to indicate its poles. How would you find out near which end is its north pole is located?

Solution: A bar magnet is hanged in the air and the end pointing to the north is the north pole of the magnet.

8. You are given an iron strip. How will you make it into a magnet?

Solution: Take a bar magnet and keep in contact with one of its poles with one edge of the bar of iron.

- Without lifting the bar magnet, move it along the length of the iron bar till you reach the other end.
- Lift the magnet and bring the pole (the same pole you started with) to the same point of the iron bar from which we began.
- Move the magnet again along the iron bar in the same direction as you did before.
- Repeat this process for about 30-40 times.

9. How is a compass used to find directions?

Solution: A compass always shows north and south direction, by keeping this as a reference we can always find east and west directions also.

10. A magnet was brought from different directions towards a toy boat that has been floating in water in a tub. Affect observed in each case is stated in Column I. Possible reasons for the observed effects are mentioned in Column II. Match the statements given in Column I with those in Column II.

Column I	Column II
Boat gets attracted towards the magnet	**Boat is fitted with a magnet with a north pole towards its head**
Boat is not affected by the magnet	**Boat is fitted with a magnet with a south pole towards its head**
Boat moved towards the magnet when the north pole is brought near its head	**Boat has a small magnet fixed along its length**
Boat moves away from the magnet when the north pole is brought near its head	**Boat is made up of magnetic material**
Boat floats without changing its direction	**Boat is made up of non-magnetic material**

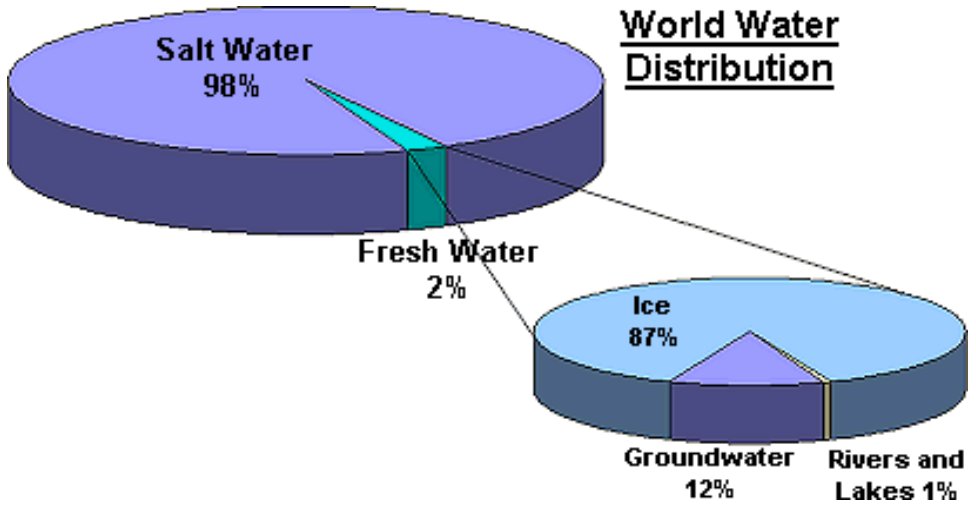
Solution:

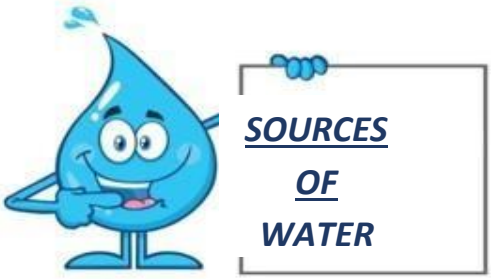
Column I	Column II
Boat gets attracted towards the magnet	Boat is made up of magnetic material
Boat is not affected by the magnet	Boat is made up of non-magnetic material
Boat moved towards the magnet when the north pole is brought near its head	Boat is fitted with a magnet with the south pole towards its head
Boat moves away from the magnet when the north pole is brought near its head	Boat is fitted with a magnet with a north pole towards its head
Boat floats without changing its direction	Boat has a small magnet fixed along its length

LESSON- 15

WATER

Water is the most essential resource for life. Water is an inexhaustible or renewable natural resource. Two- third of the earth's surface is covered with water. Nearly 70% of our body is filled with water. Water is necessary for life. Water which is fit for human consumption is called POTABLE WATER. Only 2.6% of total water is fresh water. Thus we should use it wisely.

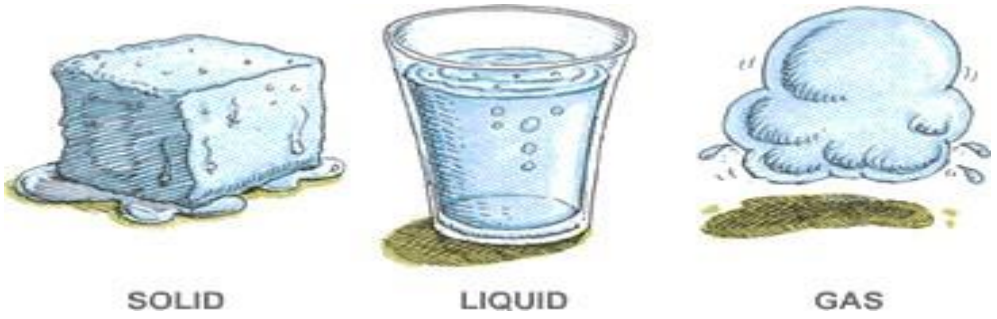




SOURCES OF WATER

Water is present in sea, oceans, lakes, rivers, streams, ponds and wells etc. Most of the water is in the oceans and seas. The water in the oceans and seas have salts dissolved in it. It is called saline water. Sources of fresh water are rain, rivers, lakes, ponds and ground water. Rain is the main source of water. It is free from germs and soluble solid impurities.

STATES OF WATER



Water on the earth exists in three states: Solid, liquid and gas. Ice is the solid state of water. Water is the liquid state. Vapour or steam is the gaseous state of water. The different physical forms are inter-convertible.

ICE ⇄ WATER ⇄ WATER VAPOUR

IMPORTANCE OF WATER

Water is used for domestic purposes such as drinking, washing, cooking, bathing, cleaning etc.

Water is used for growing various types of crops such as wheat, rice, pulses and fibers.

Water is used to produce electricity.

Water is also used in many industries.

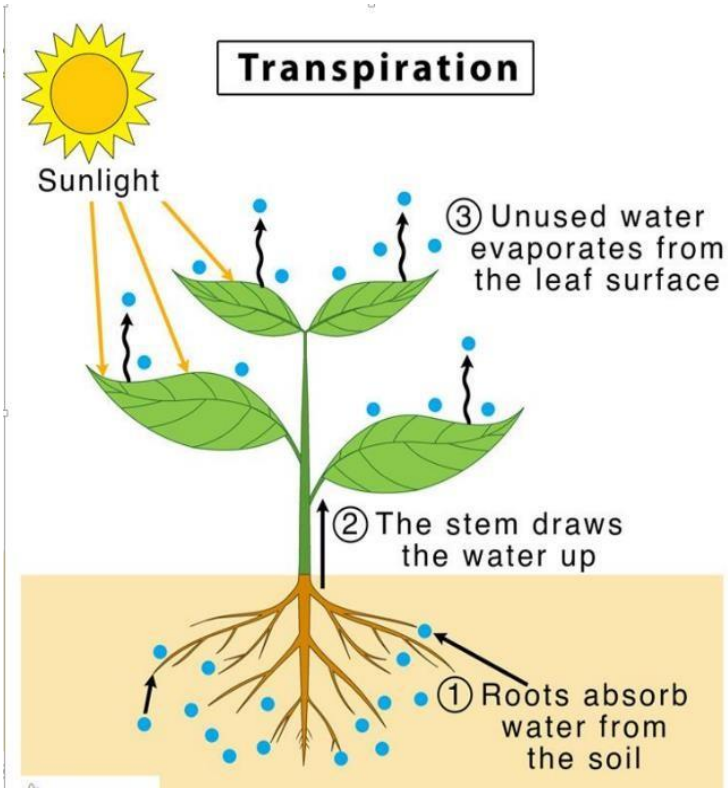
Water is needed for carrying of waste through drainage.

Water is essential for germination of seeds.

Public purpose: Swimming pools, ornamental ponds.

TRANSPIRATION

Evaporation of water in to water vapour through small pores (stomata) present on the leaves of green plants is called transpiration.



EVAPORATION

Changing of water into water vapors on heating is called evaporation.

Evaporation takes place from all the open surfaces of water all the time .It takes place continuously from oceans, seas, rivers, lakes and ponds.

CONDENSATION

The process of conversion of water vapour into water is called condensation.

Condensation is reverse process of evaporation.

Water vapor rises up in the air, cool and condense to form tiny droplets of water.

This appears as clouds. When the tiny droplets of water join together to form bigger drops of water, they fall down as rain, snow or hail and is called precipitation.

FORMS OF WATER THAT FALL ON THE EARTH

These water drops come together and fall to the earth as rain, snow or hail.

Water flows down and forms streams, ponds, lakes and

Rivers and finally goes into the seas and oceans.

Some of the water seeps into the ground and forms ground water.

GROUND WATER

The water that seeps into the ground accumulates under the ground is known as ground water. Ground water is the source of wells and lakes. Ground water is withdrawn through hand pumps and tube wells.

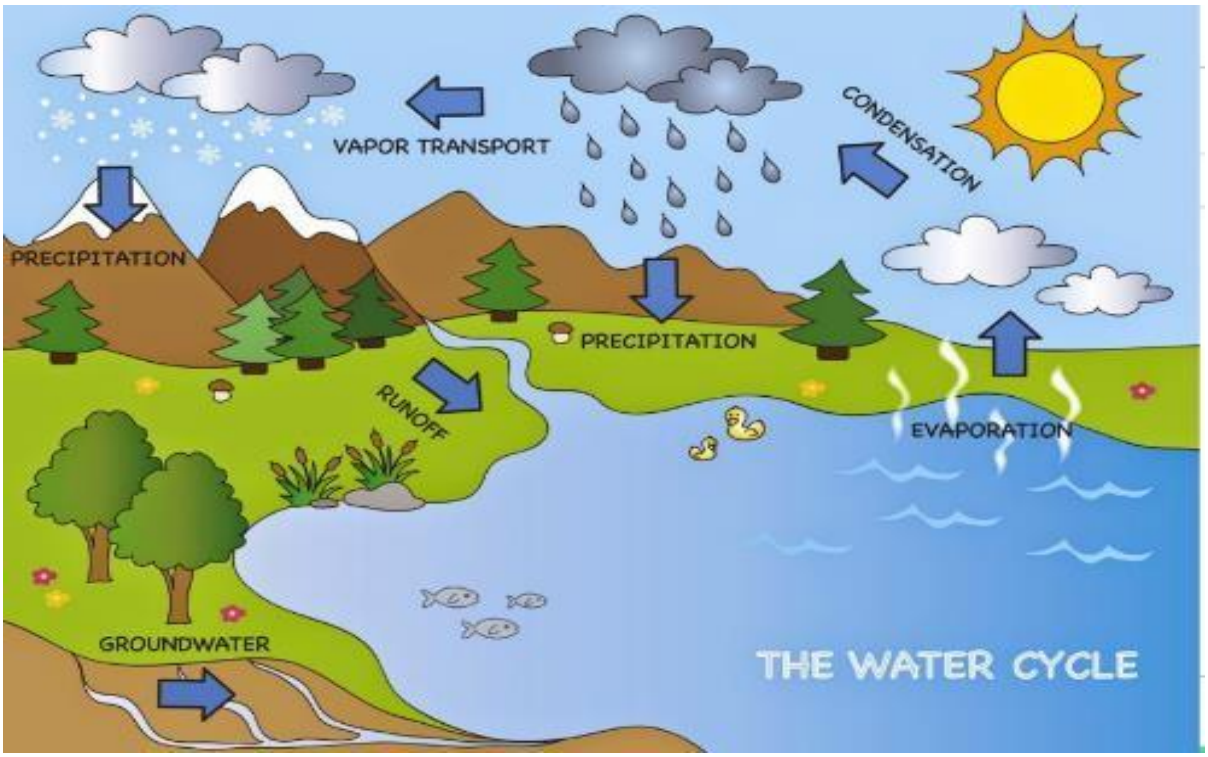
WATER CYCLE

The continuous circulation of water between the oceans, atmosphere and land is called water cycle.

The processes involved are evaporation, transpiration, condensation and precipitation.

The water from the water bodies of the earth evaporate and rise up in the air. It cool and condense to form clouds and then come back to the earth as rain, snow or hail.

In nature the water cycle takes place from sea to land and back to the sea again.



WHAT HAPPENS IF IT RAINS HEAVILY ?

If there is heavy rainfall, it will lead to rise in the water level in different water bodies. The water may then spread over large areas causing floods.

Floods may cause extensive damage to crops, animals, property and human life.

Rains also affect the animals living in the soil.

WHAT HAPPENS IF THERE IS NO RAIN ?

Due to some reasons if it does not rain in a region for a long period, the soil continues to lose water by evaporation and transpiration.

In the absence of rain, soil will becomes dry and the water level in wells and ponds will also go down.

Water will not come back to the earth by rain and *drought* may occur.

In drought, availability of food and fodder is reduced.

It may result in crop failure and loss of life due to starvation.

WAYS TO CONSERVE WATER

- Get all leaking taps repaired.
- Use a bucket for taking bath instead of a shower.
- Collect rainwater and use it for recharging ground water.
- Mop the floor instead of washing.
- Wash your cycles, cars etc. with a bucket of water instead of pipes.

RAIN WATER HARVESTING

Collecting rainwater and storing it for future use is called rainwater harvesting.

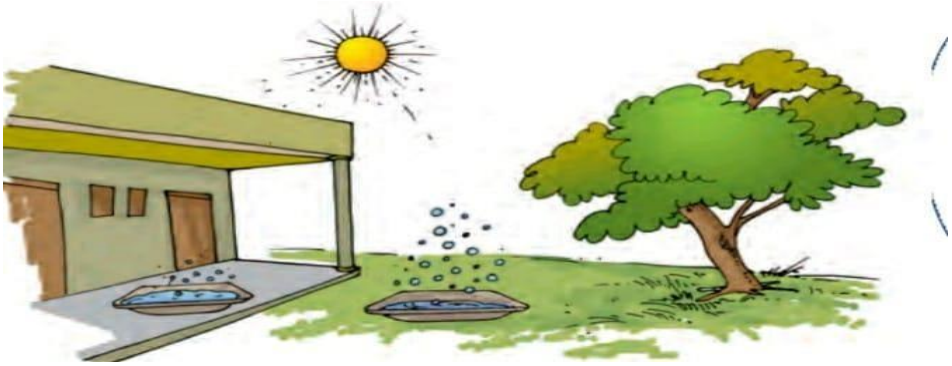
i) Rooftop rainwater harvesting:- In this method rainwater is collected from the rooftop through pipes and stored in tanks or sent into a pit in the ground to refill the groundwater.

ii) Refilling ground water:- The rainwater from roadside drains can be allowed to go directly into the ground to refill the groundwater.

ACTIVITIES

1. DISAPPEARING WATER:-

Take two similar plates pour water in both of them, one is kept in sunlight and the other one is kept in the room. Water is evaporated in both of them. In the sunlight water is evaporated quickly and in the dark later on.



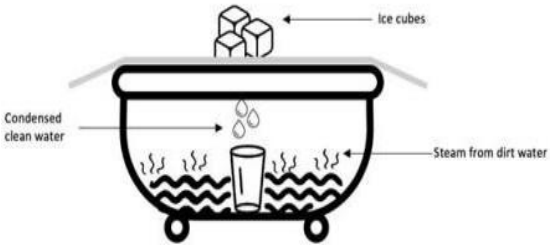
2. HOW ARE CLOUDS FORMED? :-

Materials required:

Tub, water, ice cubes, glass, plastic wrap, vinegar, salt, and dirt

Procedure:

- Pour hot water in a tub and mix salt, dirt and vinegar to create dirty water.
- Place a clean empty glass at the centre of the tub.
- Cover the tub with dirty water using a plastic wrap. Place the ice cubes right above the empty glass to represent the clouds as shown in the figure below.
  Let's think
  i.) Why does steam coming in contact with ice form water droplets?
  ii.) Are rain drops always clean water droplets? If not, why?



3. RAIN WATER HARVESTING :-

Find out if there is any provision of rain water harvesting in your house building OR Vidyalaya. Make a brief note about its utility and working.

KEY WORDS:

1. Clouds: visible mass consisting of liquid droplets, frozen crystals etc.
2. Hail: pieces of frozen rain which fall in shower
3. Condensation: process where water vapours become water
4. Evaporation: process of change of water into water vapours

5. Drought: long dry period in a certain area

6. Flood: condition of overflow of water that submerges land

7. Ocean: very large water body of salt water

8. Rain water harvesting: a technique to conserve water

9. Water vapor: gaseous form of water

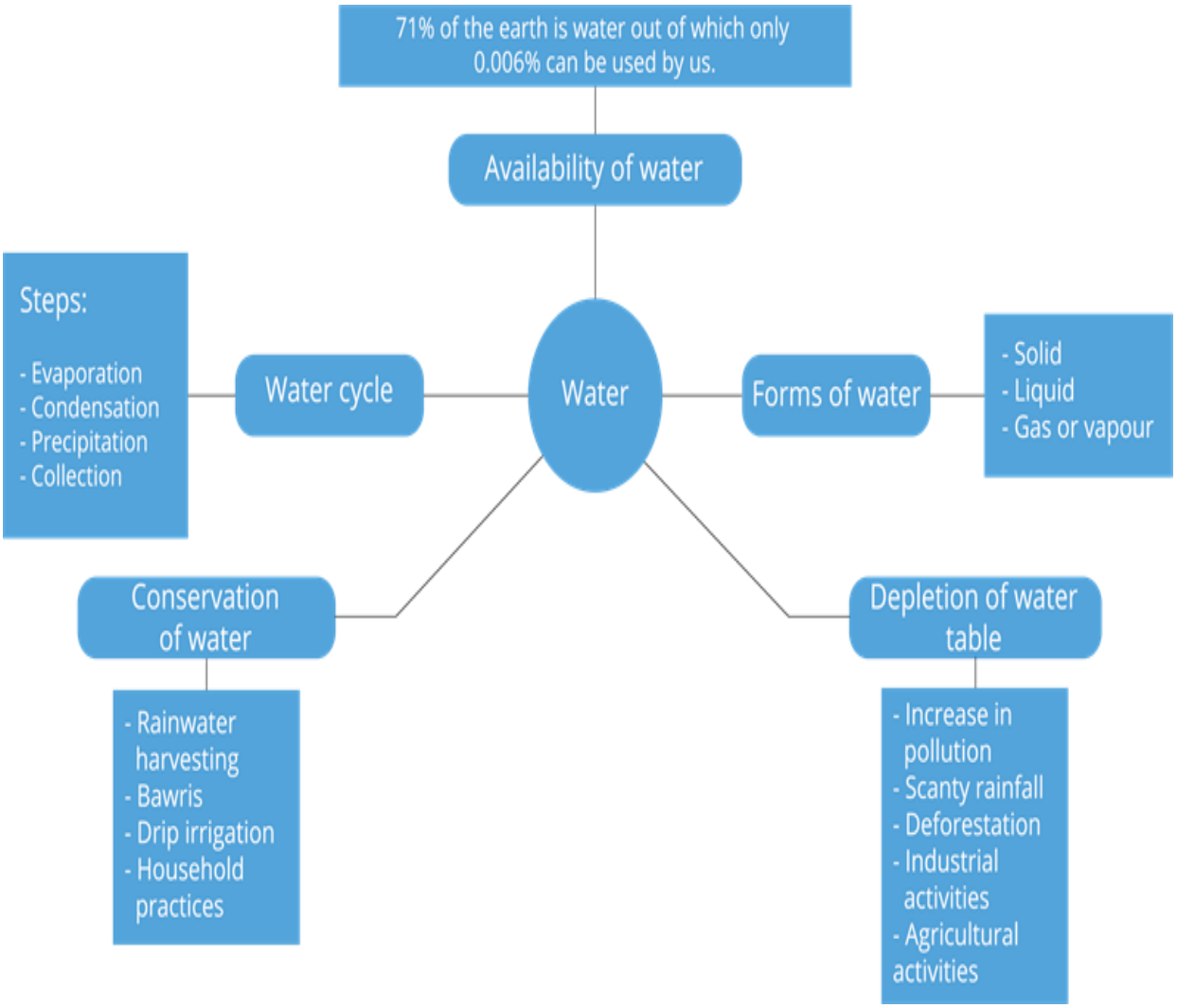
10. Water cycle: continuous movement of water on the land and in air

11. Replenish: restore

12. Potable water: water fit for drinking

13. Water pollution: undesirable change in the natural quality of water which make it unfit for use

MINDMAP



QUESTION BANK

MULTIPLE CHOICE QUESTIONS-

1. A bucket takes 20 litres of water to wash the car as compared to a hose, which uses 350 litres in 10 minutes. What would be the consequence if a hose is used to wash the car in place of a bucket?

a. It would seep-down and purify the ground water.

b. It would lead to shortage of water for other activities.

c. It would recharge the ground water with freshwater.

d. It would allow water to be reused for other household chores.

ANS: b. It would lead to shortage of water for other activities.

2. Which is the most appropriate method of rainwater harvesting at household level?

a. Cover the roof with grass

b. Dig open pits in lawn area

c. Construct drains directed to rivers

d. Connect rooftop with pipes to a pit in the ground

ANS: d. Connect rooftop with pipes to a pit in the ground

3. Which of these would help to recharge the groundwater through rainwater harvesting?

a. Directing rainwater to rivers

b. Collecting rainwater in storage tanks

c. Allowing rainwater to move as runoff on concrete roads

d. Allowing rainwater to move in roadside drains that go into the ground.

ANS: b. Collecting rainwater in storage tanks

4. The diagram shows the amount of water held by different sources of water on Earth. Based on the diagram, which water body has the maximum amount of water on Earth?

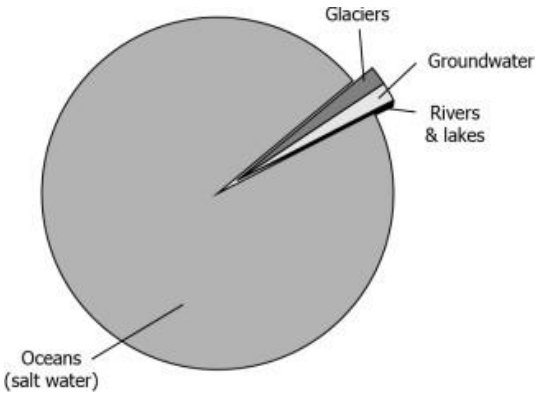
a. Oceans

b. Glaciers

c. Groundwater

d. Rivers and lakes

ANS: a.Oceans



5. The sailor on a ship, lost in the ocean can't drink its water because____

a. Water is saline

b. Water is sweet

c. Water is hot

d. Water is very cold

ANS: a. Water is saline

6. If you have to fetch water yourself from a faraway place rather than from water supply through taps. Would you use the same amount of water as on any other day?

a. No, my usage of water will reduce

b. Yes, there will be no change in consumption of water

c. I am not sure

d. None of the above.

ANS: a. No, my usage of water will reduce

7. Paheli wants to know about *the amount of water* that is required to produce one page of a book. It is _____

a. One glass

b. Two glasses

c. Ten glasses

d. Five glasses

ANS: b. Two glasses

8. One of the following may not be the source of water that we get from taps.

a. Ocean

b. River

c. Well

d. Lake

ANS: a. Ocean

9. If we add one spoon of salt to half glass of water and then boil till all the water evaporates. What will happen to the salt dissolved in water?

a. It will also evaporates

b. It will remain in the utensil

c. Salt will start burning

d. None of the above

ANS. b. It will remain in the utensil

10. In sunlight, the rate of evaporation is_____as compared to rate of evaporation in shadow.

a. Slow

b. Fast

c. Equal

d. None of the above

ANS: b. Fast

VERY SHORT ANSWER TYPE QUESTIONS-

1. Water vapour gets added to the atmosphere by_____and_____.
Ans- Evaporation, transpiration

2. Water disappears from the wet clothes by the process of_____.
Ans- Evaporation

3. The source of water below the ground such as wells, tube wells is called as_____.
Ans- Ground water

4. In winter mornings,_____is formed due to condensation of water vapour near the ground.
Ans- Fog

5. The amount of seepage of_____in the ground affects the availability of ground water.
Ans- Rainwater

6. What are the two rainwater harvesting techniques?
Ans- Rooftop rainwater harvesting, refilling ground water

7. Name two processes through which water enters into the air.
Ans- Two processes are evaporation and transpiration

8. What are the adverse effects of flood?
Ans- Damage to crops and living beings

9. What are the adverse effects of drought?
Ans- Reduced ground water level

10. State two factors leading to shortage of usable water on the earth
Ans- Increasing population and industrialization

SHORT ANSWER TYPE QUESTIONS:-

1. Why do wet clothes dried on a clothes line get dry after some time? Explain.

Ans- Wet clothes dry due to the heat of the sun by the process of evaporation. As water present in wet clothes get heated up and convert into water vapour, thus clothes get dry.

2. Water kept in sunlight gets heat from the sun and is evaporated. But how does water kept under the shade of a tree also gets evaporated? Explain.

Ans- Evaporation takes place from all the open surfaces of water.Rate of evaporation will be higher under the sun than in the shade. Thus water kept in the sunlight will get evaporated faster.

3. How do the areas covered with concrete affect the availability of ground water?

Ans- Concrete areas do not allow seepage of water. Water will not get absorbed in this area, thus ground water level will reduce.

4. To clean their spectacles, people often breathe out on glasses to make them wet. Explain why the glasses become wet?

Ans- When we breathe out, moist air comes out which make the glasses wet.

5. Suppose you want to dry your school uniform quickly, would spreading it near an angithi or heater help? If yes, how?

Ans- The rate of evaporation increases with increase in temperature. So, near the angithi or heater, the rate of evaporation will be higher and the uniform will dry up quickly.

6. When does a drought occur?

Ans- If it does not rain in a region for a year or more, drought occurs. The soil becomes dry due to continuous loss of water by evaporation and transpiration. The level of water in wells and ponds goes down and some of them even dry up.

7. Take out a cooled bottle of water from refrigerator and keep it on a table. After some time you notice few droplets of water around it. Why?

Ans. It is due to condensation of water vapours present in the air. Air contains water in the form of vapours which get condense when come in contact of cooled water bottle and converted into water droplets.

8. Fill in the blanks selecting words from the following list
snow, rain, clouds, vapour,evaporation, transpiration.

Water, as_____goes into the atmosphere by the processes of_____and_____, forms _____, which on condensation fall in the form of_____and_____.

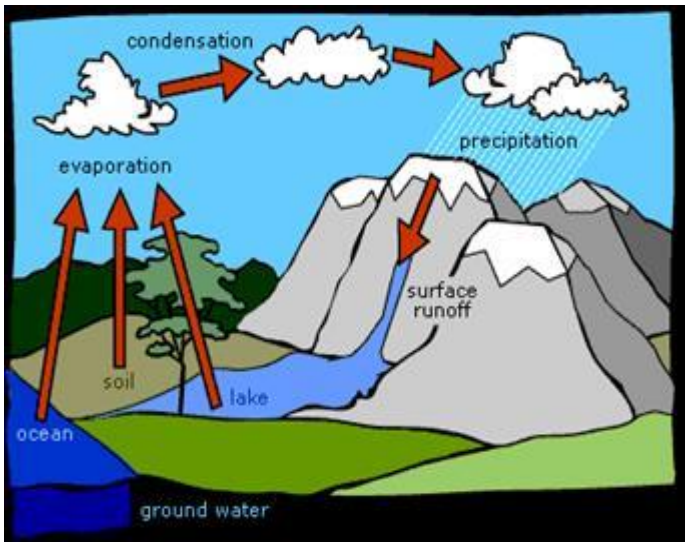
Ans- vapour, evaporation, transpiration, clouds, rain, snow

LONG ANSWER TYPE QUESTIONS

1. Most of the water that falls on the land as rain and snow, sooner or later goes back to a sea or an ocean. Explain how it happens?

Ans- The rain falling on the ground is a source of ground water. When it falls on the earth it gets seeps into ground and portion of it flows into other sources of water bodies like rivers, lake sand wells and then it flow into seas or oceans. And when snow falls on the surface of the earth in the form of ice, snow or as a glacier. It melts and flows down in the form of rivers, lakes and gets merged with the ocean and seas.

2. Draw a diagram to show how sea water reaches a lake or pond.



3. Dissolve two spoons of common salt in half a cup of water. Now if you want to get the salt back, what will you do?

Ans- To get the salt back we can heat the solution so that water can evaporate leaving the crystals of salt back. This can also be done if the solution is kept in sun for few hours. The water will get evaporated and crystals of salt will be left behind.

4. Explain the process of rooftop rain water harvesting with the help of a suitable diagram.

Ans- Rainwater containing soil from the roof is collected from the rooftop and is collected into a storage tank, through pipes. Second step is to filter the stored water. The water can also be transported into a pit in the ground. This then seeps into the soil to recharge or refill the ground water.

5. How are clouds formed?

Ans- Evaporation takes place from all the open surfaces of water. As a result,water vapour gets continously added to air. As these vapours go higher from the earth surface, it gets cooler and cooler.At sufficient heights, the air becomes so cool that the water vapour get condense to form tiny drops of water.These droplets remain floating in air and appear to us as clouds.

CCT BASED QUESTIONS-

CASE-I

As we know that 71% of earth surface is covered with water. Most of the water on the earth surface is found in seas and ocean and is saline. Freshwater is found frozen in the ice caps at the two poles and on snow covered mountains. The underground water and the water in rivers, lakes and ponds is also fresh .Some amount exists in the form of water vapour. However, the availability of freshwater varies from place to place

.Practically every summer most places have to face a scarcity of water. In rural areas people are forced to spent considerable amounts of time in fetching water from far away sources.

1. How much earth surface is covered with water?

a. 71%
b. 72%
c. 73%
d. 74%

Ans- a. 71 %

2. Can we use the water of following sources for drinking? Answer as yes or no for each case.

a) Seawater YES/NO

b) Groundwater YES/NO

Ans- a. NO

b. YES

3 In rural areas people are forced to spent considerable amounts of time in fetching water from faraway sources. Why?

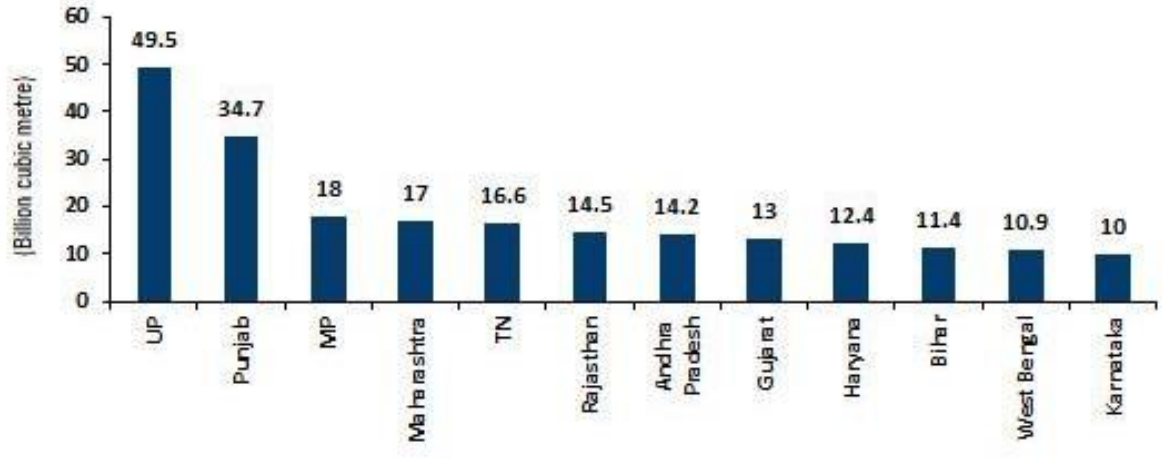
Ans- Non availability of drinking water in nearby areas

4. What are the different forms of water which exist on earth.

Ans. Three forms- solid, liquid and gas

CASE-II

Groundwater is a major source of freshwater. Groundwater is that water which is found inside the earth. Groundwater is the source for many lakes, ponds, wells and tube wells. But the level of ground water decreases due to many human activities like increasing population, industrialization, construction work, agricultural activities and decreasing the effective seepage area. Here is the graph which shows the use of groundwater by different states of India.



1. Which states use maximum and minimum amount of groundwater?

Ans- Maximum- UP, Minimum- Karnataka

2. Ground water is recharged by the process of-

a. Evaporation

b. Condensation

c. Transpiration

d. Seepage of rainwater

Ans- d. Seepage of rainwater

3. Which of the following activities decreases the level of groundwater?

Increasing population Yes/No

Growing plants Yes/No

Ans- Yes, No

4. What are the factors which decreases the level of groundwater?

Ans- Increasing population, growing human activities, industrialization.

NCERT Exercises

1. Fill up the blanks in the following:

(a) The process of changing of water into its vapour is called_____.

(b) The process of changing water vapour into water is called_____.

(c) No rainfall for a year or more may lead to_____in that region.

(d) Excessive rains may cause_____.

Ans-

(a) The process of changing of water into its vapour is called evaporation

(b) The process of changing water vapour into water is called condensation.

(c) No rainfall for a year or more may lead to drought in that region.

(d) Excessive rains may cause floods.

2. State for each of the following whether it is due to evaporation or condensation:

(a) Water drops appear on the outer surface of a glass containing cold water.

(b) Steam rising from wet clothes while they are ironed.

(c) Fog appearing on a cold winter morning.

(d) Blackboard dries up after wiping it.

(e) Steam rising from a hot girdle when water is sprinkled on it.

Ans- (a) Condensation , (b) Evaporation , (c) Condensation , (d) Evaporation

(e) Evaporation

3. Which of the following statements are “true”?

(a) Water vapour is present in air only during the monsoon.

(b) Water evaporates into air from oceans, rivers and lakes but not from the soil.

(c) The process of water changing into its vapour, is called evaporation.

(d) The evaporation of water takes place only in sunlight.

(e) Water vapour condenses to form tiny droplets of water in the upper layers of air where it is cooler.

Ans-

(a) Not true

(b) Not true

(c) True

(d) Not true

(e) True

4. Suppose you want to dry your school uniform quickly. Would spreading it near an anghiti or heater help? If yes, how?

Ans- Yes, spreading it near an anghiti or heater will surely help as heater and anghiti are source of heat which vaporize the water of the wet clothes and thus help in drying.

5. Take out a cooled bottle of water from refrigerator and keep it on a table. After some time you notice a puddle of water around it. Why?

Ans- The puddle of water seen around the cooled bottle of water is due to the condensation effect as the water vapour present in the air around the bottle get condensed after colliding with bottle.

6. To clean their spectacles, people often breathe out on glasses to make them wet. Explain why the glasses become wet.

Ans- Water vapour also gets released during exhalation process along with carbon dioxide. These water vapour gets attached with the glasses of the spectacles and then condensed in the presence of air surrounding it and thus making it wet.

7. How are clouds formed?

Ans- When the air moves up, it gets cooler and cooler and after reaching sufficient heights, the air becomes so cool that the water vapour present in it condenses to form tiny drops of water called droplets which remain floating in air and thus clouds are formed.

8. When does a drought occur?

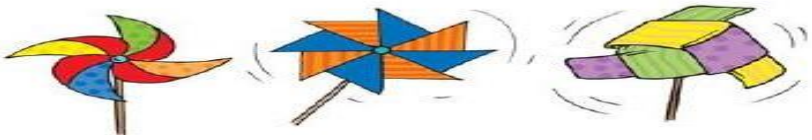
Answer Drought occurs when an area does not receive rainfall for a period of year or more. Also, the soil continues to lose water by evaporation and transpiration and becomes dry and the ground water may also become scarce which may lead to drought.

LESSON- 15

AIR AROUND US

Have you ever seen air?

You might not have seen air but you might have felt air .Given below are some pictures which show various processes occurring due to air.

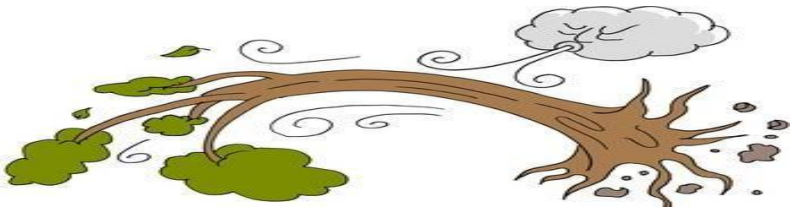


Various types of firki.

You also can make one using paper and a light wooden stick.

You can hold the firki in an open area you will observe that it rotates.

It is due to moving air.



You would also have seen trees uprooted sometimes as an aftermath of storm. You would have observed a weather cock rotating on its axis on a windy day.

You would have observed rustling of leaves, swaying of branches of trees when the wind blows.

You might have observed farmers separating grains from husk using wind by the process of winnowing.

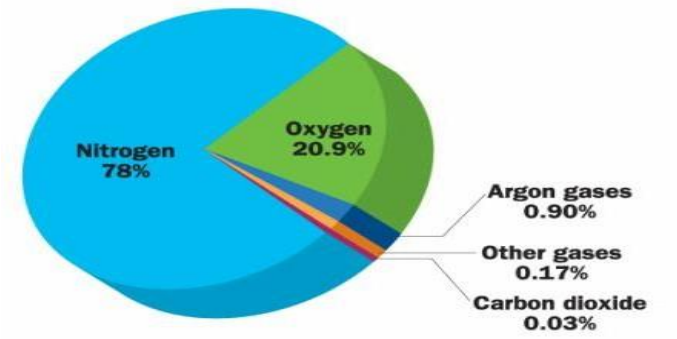
Have you ever thought what makes all the above mentioned activities occur?

It is air which makes all the above mentioned activities occur.

AIR

- Air is a mixture of gases. It also consists of water vapours and dust particles.
- It is present everywhere.
- It is essential for survival.
- It is transparent, colourless.
- It exerts pressure in all directions.
- The layer of air around earth is known as atmosphere.
- Moving air is called wind.
- Air has volume and occupies space.
- Air is present in dissolved form in water for the survival of aquatic plants and animals.
- There is interdependence between plants and animals for the exchange of oxygen and carbon dioxide.

COMPOSITION OF AIR



OXYGEN

- 21% in the atmosphere.
- Essential for survival.
- Supporter of combustion.
- Produced by plants by the process of photosynthesis.
- Living organisms need oxygen for the process of respiration

CARBON DIOXIDE

- 0.03% in the atmosphere
- Essential for photosynthesis.
- Produced during burning and photosynthesis.

- Not a supporter of combustion.

NITROGEN

- 78% in the atmosphere.
- Important component of fertilizers.

WATER VAPOURS

- Air contains water vapours which cool by the process of condensation.

DUST AND SMOKE

- Smoke is produced due to various factors like burning ,vehicular exhaust, industries etc.

ATMOSPHERE :-

- Our earth is surrounded by a thin layer of air.
- This layer extends up to many kilometers above the surface of the earth and is called atmosphere.
- As we move higher in the atmosphere, the air gets rarer.
- Mountaineers carry oxygen cylinders with them, while climbing high mountains.

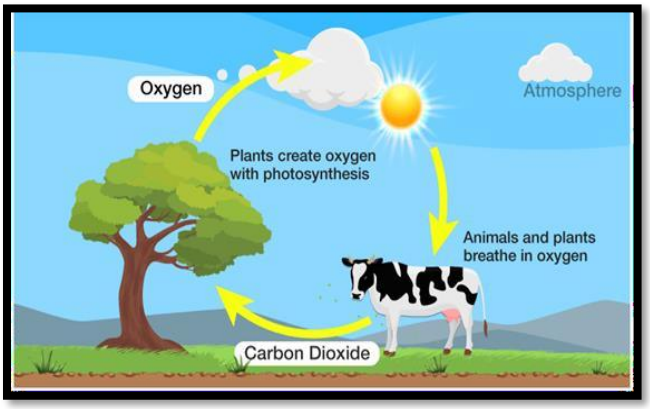
A mountaineer carrying oxygen cylinder

WIND MILL :-

- The wind makes the windmill rotate.
- The wind mill is used to draw water from tube wells and to run flour mills.
- Wind mills are also used to generate electricity.

USES OF AIR :-

- Air is essential for survival
- Oxygen is required for respiration, carbon di oxide is required for the process of photosynthesis.



A Diagrammatic Representation of the Oxygen Cycle

- Air helps in the movements of sailing yachts, gliders, parachutes and aircraft.
- Air is used for drying up of clothes

- Air also helps in dispersal of seeds and pollens of flowers.

- Compressed air is used to inflate the tyres of vehicles.
- Nitrogen is an important component for the manufacture fertilizers.
- Winnowing the method to separate lighter and heavier components uses air.
- Air is also useful for playing several musical instruments like flute.
- Birds, bats and many insects fly in the air.

ACTIVITIES

1. AIR IS PRESENT EVERYWHERE AROUND US :-

MATERIALS REQUIRED: Empty bottle, container, water.

PROCEDURE :

- Take an empty open bottle. Is it really empty or does it have something inside? Turn it, upside down. Is something inside it, No.
- Now, dip the open mouth of the bottle into the bucket filled with water.
- What do you observe?
- Does water enter the bottle?
  No
- Now tilt the bottle slightly.
- Does the water now enter the bottle? Do you see bubbles coming out of the bottle or hear any bubbly sound? Can you now guess what was in the bottle?
- Yes , water is able to enter the bottle and bubbles are formed due the presence of air in the empty bottle.

2. TO SHOW THAT SOIL CONTAINS AIR :-

- When the water is poured on the lump of soil as shown in the picture also, it displaces the air which is seen in the form of bubbles.
- The organisms that live inside the soil and the plant roots respire in this air.

3. OBSERVING DUST IN AIR IN THE PRESENCE OF SUNLIGHT:-

- Close all the doors and windows with curtains pulled down to make the room dark.
- Now, open the door or a window facing the sun, just a little, in such a way that it allows sunlight to enter the room only through a slit.
- Look carefully at the incoming beam of sunlight
- Some tiny shining particles moving in the beam of sunlight are observed these are the dust particles present in the air.

KEY WORDS:

1. ATMOSPHERE - The layer of air around earth.

2. COMPOSITION OF AIR **-** Nitrogen -78% **,** Oxygen -21% **,** Carbon di oxide -0.03% **,** Other gases water vapours and dust .

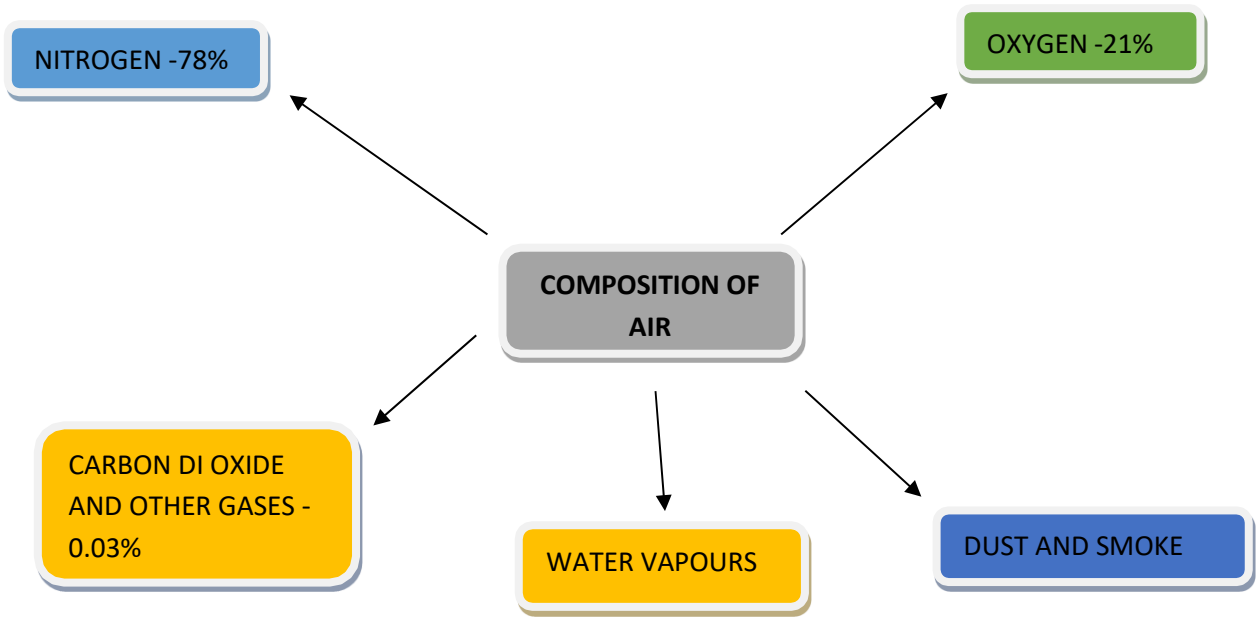
3. CARBON DIOXIDE **-** Essential for photosynthesis , Exhaled during respiration

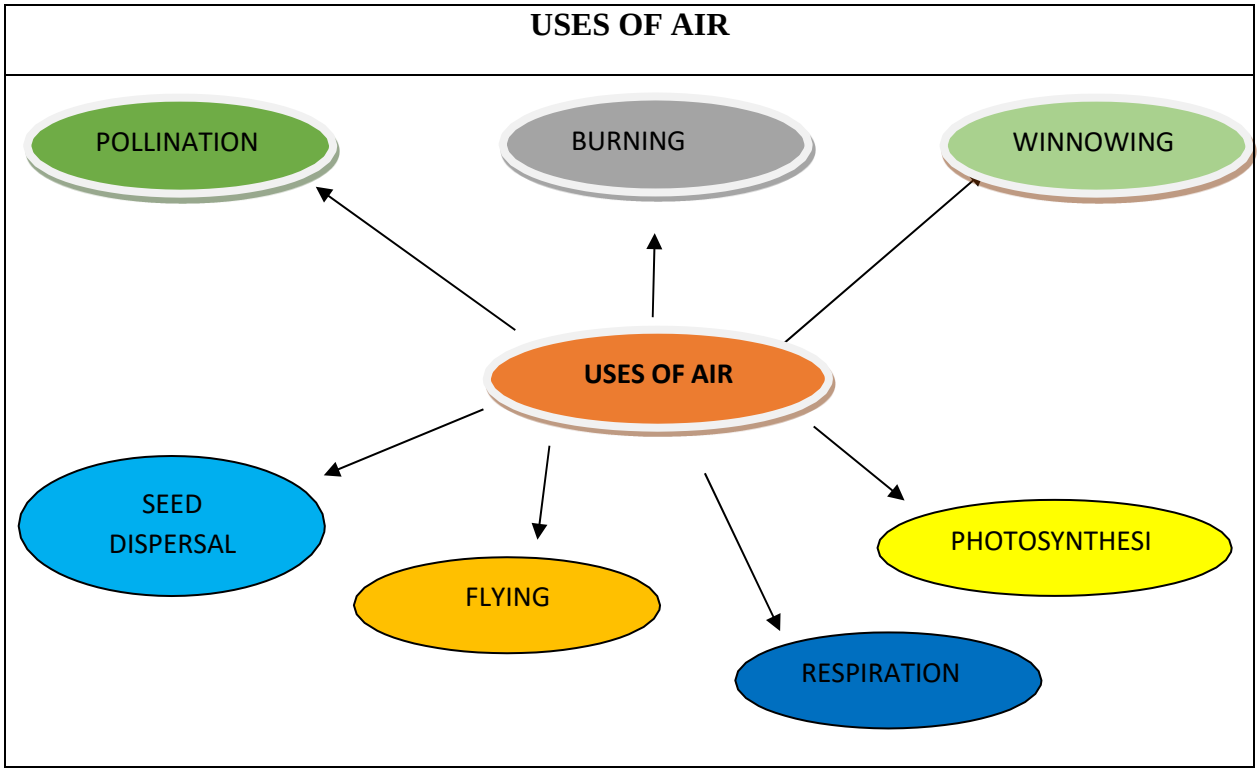
4. OXYGEN - Essential for respiration and burning

5. NITROGEN - Does not support combustion

6. SOURCES OF SMOKE - Burning ,Vehicular emission ,Industries

MINDMAP





QUESTION BANK

MULTIPLE CHOICE QUESTIONS-

1. Which of the following statements is incorrect?

(a) All living things require air to breathe.

(b) We can feel air but we cannot see it.

(c) Moving air makes it possible to fly a kite.

(d) Air is present everywhere but not in soil.

Ans- (d) Air is present everywhere but not in soil.

2. Air is present in

(a) atmosphere

(b) soil

(c) water of ponds, lakes and seas

(d) everywhere

Ans- (d) everywhere

3. Air is

(a) a mixture

(b) a pure substance

(c) an element

(d) anything, that depends on the place where it is found

Ans- (a) a mixture

4. Envelope of air that surrounds the earth is known as

(a) biosphere

(b) atmosphere

(c) environment

(d) ecosystem

Ans- (b) atmosphere

5. Which is not a property of air?

(a) It occupies space.

(b) It is transparent,

(c) It is a solution.

(d) It is a compound.

Ans- (d) It is a compound.

6. Which of the following gas helps in burning?

(a) Nitrogen

(b) Oxygen

(c) Carbon dioxide

(d) Carbon monoxide

Ans- (b) Oxygen

7. Major part of the air is constituted by

(a) Nitrogen

(b) Oxygen

(c) Carbon dioxide

(d) Inert gases

Ans- (a) Nitrogen

8. Wind is

(a) air around us

(b) rising hot air

(c) air in motion

(d) none of these

Ans- (c) air in motion

9. Which gas is used during the process of photosynthesis by green plants

(a) Nitrogen

(b) Oxygen

(c) Carbon dioxide

(d) Carbon monoxide

Ans- (c) Carbon dioxide

10. Which of the following gas we use in breathing?

(a) Carbon dioxide

(b) Nitrogen

(c) Oxygen

(d) None of these

Ans- (c) Oxygen

VERY SHORT ANSWER TYPE QUESTIONS-

1. What happens when air comes in contact with cold water?

Ans- Water present in air condenses to form bigger water droplets

2. Name the major gases present in (a) inhaled air (b) exhaled air

Ans- (a) oxygen (b) carbon dioxide.

3. Name the device which uses wind energy to generate electricity

Ans- Wind mill

4. Name the gases present in Air . Which one of them is most abundant ?

Ans- Nitrogen , Oxygen , Argon , Carbon dioxide , Water vapour , Neon , Helium etc. are present in air. Nitrogen is most abundant.

5. In a number of musical instruments, air plays an important role. Can you name any two such instruments?

Ans- Flute and Xylophone

6. State whether the following statements are true or false. If false, correct them.

(a) Plants consume oxygen for respiration.

(b) Plants produce oxygen during the process of making their own food.

Ans- (a)True

(b) True

7. Give any two uses of Wind mill.

Ans- (i) Wind mill is used to draw water from tube well.

(ii) Wind mill is used to generate electricity.

8. How does earthworm breathe in the soil?

Ans- Earthworm breathe through their skin

SHORT ANSWER TYPE QUESTIONS:-

Q-1. Why do we feel suffocated when something is burned in a closed room?

Ans- Burning produces smoke and carbon di oxide along with other gases which results in suffocation.

Q-2. Why does the sky and air look clean after rainfall?

Ans- Rain water brings down the dust and smoke suspended in the air resulting in the sky looking clean.

Q-3 In case of fire one is advised to wrap a woolen blanket around. Why?
Ans- Wrapping a blanket around in case one catches fire prevents the contact of the burning substance with oxygen resulting in extinguishing the fire.

Q-4. Why do you think mountaineers carry oxygen cylinders with them while climbing mountains?
Ans- As we go up in the mountains the amount of oxygen present in the atmosphere decreases and it becomes hard to breathe.

Q-5 Name the two processes which result in maintaining the balance between oxygen and carbon dioxide levels of the atmosphere.

Ans- Respiration and photosynthesis

Q-6 Match the following :

COLUMN I	COLUMN II
(a) weather cock	(i) gases and fine dust particles
(b) mountaineers	(ii) sailing yacht
(c) fine hair inside the nose	(iii) oxygen cylinders
(d) smoke	(iv) direction of air flow
(e) wind	(v) prevent dust particles

Ans-

(a) –iv
(b) –iii
(c) -v
(d) -i
(e) -ii

Q-7. Unscramble the following :

	Column I	Column II
(a)	D I L L M W I N	(a) _ _ _ _ _ _ _ _
(b)	Y N O G X E	(b) _ _ _ _ _ _
(c)	M E S K O	(c) _ _ _ _ _
(d)	T U D S	(d) _ _ _

Ans- (a) Windmill

(b) Oxygen

(c) Smoke

(d) Dust

LONG ANSWER TYPE QUESTIONS

Q1. Nancy kept some water in a beaker for heating. She observed that tiny bubbles appeared before the water started to boil. She boiled the water for about 5 minutes and filled it in a bottle up to the brim and kept the bottle air tight till it cooled down to room temperature.

(a) Why did the tiny bubbles appear?
(b) Do you think tiny bubbles will appear on heating the water taken out from the bottle?
Justify your answer.

Ans- (a) As air is present in water on heating it results in formation of bubbles

(b) No as on heating the water previously the air present escaped.

Q2. Write what will happen in an imaginary situation if any of the following gases disappear from the atmosphere

(a) oxygen
(b) carbon dioxide

Ans- (a) Respiration will not occur all living organisms which need oxygen will not survive. Burning of substances will not occur.

(b) Photosynthesis will not occur, green plants will not be able to prepare their Food.

Q3. Explain the following observations very briefly

(a) You would have seen a firki as shown in the picture given below does not rotate in a closed area.

(b) The arrow of weather cock points towards a particular direction at a particular moment.

(c) An empty glass in fact is not empty. Justify the statement.

(d) We should not breathe from our mouth.

Ans-

a) As there is no air.
b) It shows the direction in which the wind is blowing
c) It contains air which occupies space and has mass.
d) As air may contain dust particles.

CCT BASED QUESTIONS-

CASE-I

Ozone

The atmosphere is a mixture of gases and other substances for sustaining life on the Earth. Unfortunately, human activities based on national/personal interests are causing harm to this common resource, by depleting the ozone layer, which acts as a

protective shield for life on the Earth. Ozone molecules consist of three oxygen atoms, while the oxygen molecules consist of two oxygen atoms. Ozone molecules are exceedingly rare: fewer than ten in every million molecules of air.However, for nearly a billion years, their presence in the atmosphere has played a vital role in safeguarding life on Earth.

Depending on where it is located, ozone can either protect or harm life on Earth. The 10 percent ozone in the troposphere (up to 10 kilometers above the Earth's surface) is "bad" ozone which can damage lung tissues and plants. But about 90 percent of ozone found in the stratosphere (between 10 and 40 kilometres above the Earth's

surface) is "good" ozone which plays a beneficial role by absorbing dangerous ultraviolet (UV) radiation from the Sun. Without this ozone layer, humans would be more susceptible to certain diseases due to the increased incidence of ultra-violet rays from the Sun. In the last decades the amount of ozone has decreased. In 1974 it was hypothesised that chlorofluorocarbons (CFCs) could be a cause for this. Until 1987, scientific assessment of the cause-effect relationship was not convincing enough to implicate 20 CFCs. However, in September 1987, diplomats from around the world met in Montreal (Canada) and agreed to set sharp limits to the use of CFCs.

ANSWER THE FOLLOWING QUESTIONS-

Q1. State the formula of oxygen gas and ozone

Ans- Oxygen –O_2, Ozone –O_3

Q2. Ozone is also formed during thunderstorms. It causes the typical smell after such a storm. In the above paragraph the author of the text distinguishes between "bad ozone" and "good ozone". In terms of the article, is the ozone that is formed during thunderstorms "bad ozone" or "good ozone"? Choose the answer and the explanation that is supported by the text.

	Bad ozone or good ozone?	**Explanation**
A.	Bad	It is formed during bad weather
B.	Bad	It is formed in the troposphere
C.	Good	It is formed in the stratosphere.
D.	Good	It smells good.

Ans- B. Bad. It is formed in the troposphere.

Q-3. In the above paragraph it is stated: “Without this beneficial ozone layer, humans would be more susceptible to certain diseases due to the increased incidence of ultra-violet rays from the Sun.” Name one of these specific diseases.

Ans- Skin cancer

CASE-II

Air is present all around us. We can feel the presence of air but cannot see the air around us. Air is a mixture of gases. The different components of air includes – 78% nitrogen, 21% oxygen, 0.9% argon, 0.03% carbon dioxide, and about 1% water vapour. Air plays an important role in breathing and burning. The existence of life on the planet earth is mainly because of the presence of air.

ANSWER THE FOLLOWING QUESTIONS-

Q1. Moving air is called

(a) Dust

(b) Smoke

(c) Wind

(d) Nitrogen

Ans- (c) Wind

Q2. What are the properties of Air?

(a) It occupies space

(b) it is present everywhere around us.

(c) it has no colour & it is transparent.

(d) All of the Above.

Ans- (d) All of the Above.

Q3. Envelope of air that surrounds the Earth is known as ……..

(a) Biosphere

(b) Atmosphere

(c) Ecosystem

(d) Environment

Ans- (b) Atmosphere

NCERT Exercises

1. What is the composition of air?

Solution:

COMPOSITION OF AIR

Nitrogen -78%

Oxygen -21%

Carbon dioxide - 0.03%

Other gases

Water vapours and dust

2. Which gas in the atmosphere is essential for respiration?

Solution: Oxygen

3. How will you prove that air supports burning?

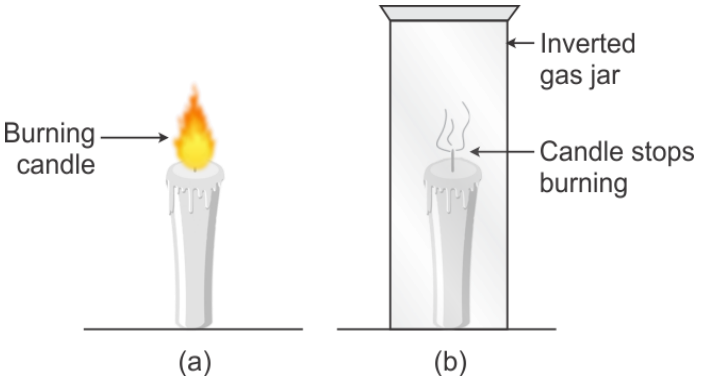
Solution : Air is essential for burning

MATERIALS REQUIRED – candle, glass, matchboxPROCEDURE

- Take a candle and fix it on a table, light the candle.
- The candle will continue to burn due to continuously available fresh air providing the required oxygen for combustion.
- Now cover the burning candle by putting an inverted gas jar over it.

What will you observe?

- After a short time, the candle stops burning and gets extinguished.
- When the burning candle is covered with gas jar, then the candle takes away the oxygen necessary for burning from the air enclosed in the gas jar.
- After some time, when all the oxygen of air inside the gas jar is used up, then the burning candle gets extinguished. This proves that air is necessary for combustion of substances.



4. How will you show that air is dissolved in water?

Solution:

- Take some water in a glass or metal container.
- Heat it slowly on a tripod stand.
- Tiny bubbles on the inside of the container are observed.
- These bubbles come from the air dissolved in water.
- When the water is heated the air dissolved in it escapes. As water is further heated, the water itself turns into vapour and finally begins to boil.

5. Why does a lump of cotton wool shrink in water?

Solution: A lump of cotton wool has a lot of air trapped inside the space present in its fibers. When this lump of cotton is immersed in water, all the air is replaced by water. Due to this, the cotton lump shrinks down.

6. The layer of air around the earth is known as_____.

Solution: Atmosphere

7. The component of air used by green plants to make their food, is _____.

Solution: Carbon dioxide

8. List five activities that are possible due to the presence of air.

Solution:

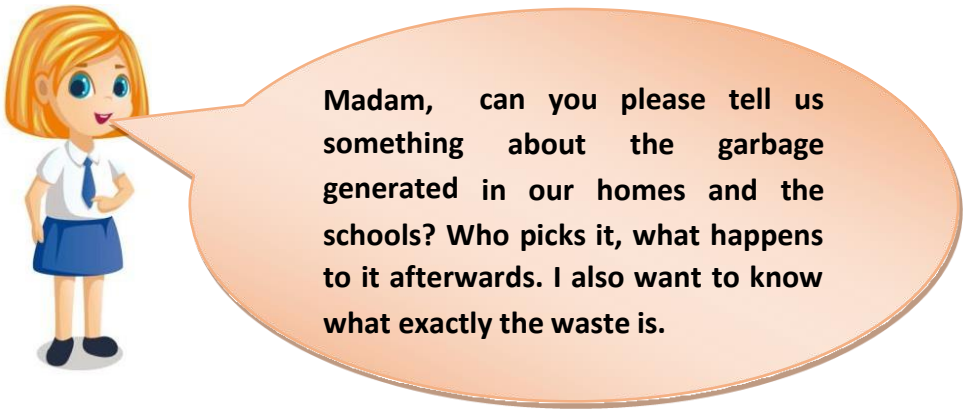
- Breathing
- Photosynthesis
- Burning
- Flying
- Pollination

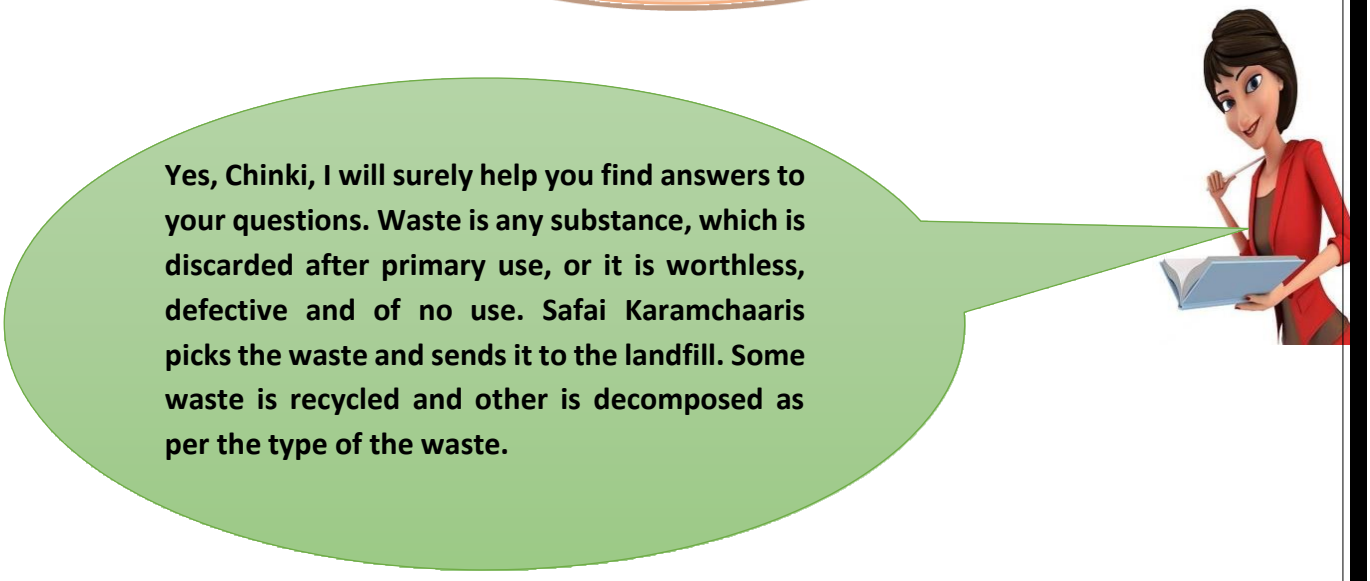
LESSON- 16

GARBAGE IN , GARBAGE OUT

Ramesh and Chinki were two friends who lived in a Residential Colony. One Day, they noticed that people in their Society generating so much garbage in day-to-day activities! They were throwing groundnut shells on public places, in after eating the nuts. They also saw their neighbours throwing away many domestic wastes such as broken toys, old clothes, shoes and slippers here and there and not in proper bins. They wondered how much garbage is being thrown out by the people and the garbage thrown by the School they study in. They wondered what happens to so much Garbage? Where did it all go? What happens after the Safai Karmchari Picks up the Garbage in front of their Homes and Schools?

Next day when they went to their school, they asked this question to their teacher.





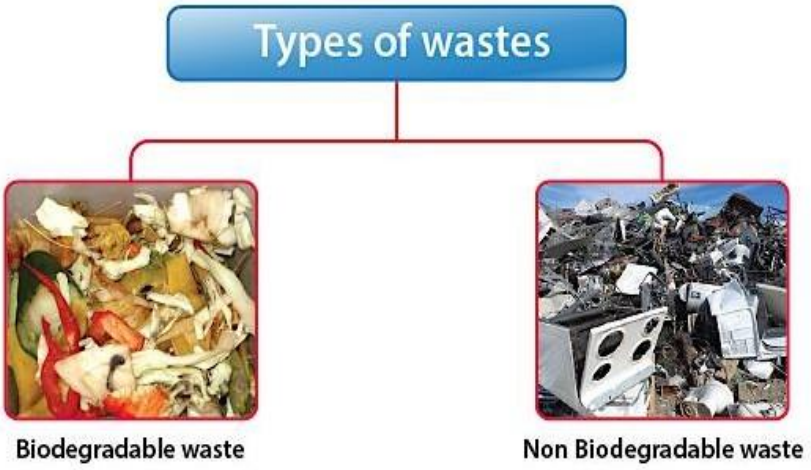
Madam Is it possible for all of this garbage to be changed into something that will not harm us?

Yes, this is possible as the waste are of two types, biodegradable and non-biodegradable. Biodegradable waste can be converted into useful form manure and compost and non-biodegradable waste can be recycled. Let us study the chapter in detail to know more about the type of waste and its generation.

What is Garbage?

WATER AND AIR AS RENEWABLE NATURAL RESOURCE

All the waste materials and other household waste produced on a daily basis are termed as garbage. The different wastes of garbage contain peels of vegetable and fruits, leftovers cooked food products, waste paper, and plastic materials, and many other waste items.



Basic classification of waste

1. **Biodegradable wastes:** The waste that can be converted into simple forms of carbon dioxide, oxygen, water or other forms such as compost by the action of microorganisms are called biodegradable. Once these are broken down into simple forms or degraded, they are converted into useful materials that can be used in the soil as manure. Example - vegetable and fruit peels, animal waste, farm waste etc.
2. **Non-biodegradable wastes:** This waste cannot be broken down into simpler forms by microorganisms. These wastes remain as it is in the soil for years and cause harm to organisms. Example: plastics, glass, parts of electronic items, tyres etc. These can only be recycled.

Do you know?

The Prime Minister of India launched the Swatch Bharat Mission (SBM). The aim of this mission is to create an open defecation-free India by 2 October 2019.

Under the mission, all villages, Gram Panchayats, Districts, States and Union Territories in India declared themselves "open-defecation free" (ODF) by 2 October 2019, the 150th birth anniversary of Mahatma Gandhi, by constructing over 100 million

WASTE GENERATION: -

- Waste generation is the amount of waste produced by a house, a community or even the country.
- Developed nations tend to produce more garbage than developing nations as they have a higher rate of consumption**.**

WASTE SEGREGATION :-

The process of segregating or dividing the wastes into dry and wet is defined as Waste Segregation. Here, the dry waste includes wood and related products, metals and glass. The wet waste, typically refers to organic waste usually generated by eating establishments and are heavy in weight due to dampness.

This method is used to separate the biodegradable waste to the non-biodegradable waste. We used the following ways to segregate the waste :-

i. **Red-coloured bins:** Toxic waste materials like syringes, expired medicines andbatteries are collected in the red-coloured bins.

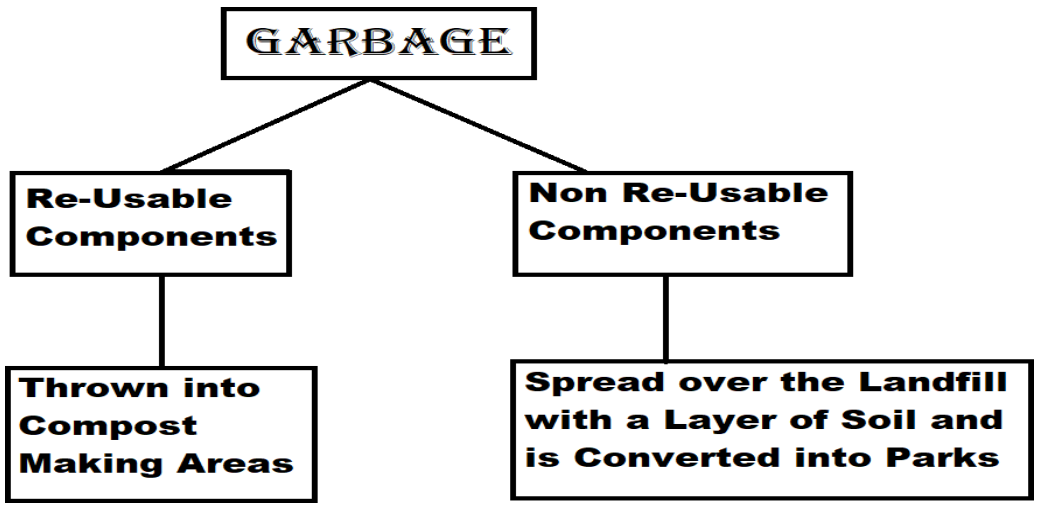
ii. **Green-coloured bins:** The waste like stale food, fruit and vegetables peels, andgarden litter collected in the green-coloured bins.

iii. **Blue-coloured bins:** Recyclable waste like plastic, metal and glass are collected in the blue-coloured bins.

RED GREEN BLUE

LANDFILL:- Low lying Open Area where Different types of Garbage gets Separated.

In a LANDFILL, The Garbage gets separated into 2 Parts, Reusable and Non-Reusable Items. Non-Useful Components are spread over the Landfill and then covered with a thin layer of Soil. Once the landfill is completely full, it is usually converted into a park or a playground. For the next 20 years or so, no building is constructed on it. To deal with some of the useful components of garbage, Compost making areas are developed near the landfill.



MANURE AND COMPOST :-

- Manure: Organic Matter that is used as a Natural Fertilizer for Plants which mainly Consists of Animal Excreta, Kitchen Waste, Green Waste, etc.
- Composting: The rotting and conversion of some materials into manure.
- As many Types of Wastes don't rot or take a very long time to decompose, it is difficult to separate them with the wastes that rot.
- Vermicomposting is the process of conversion of biodegradable waste into manure with the help of red worms.

ACTIVITIES

Activity - 1 :-

Collect the garbage from your house before it is thrown into the dustbin. Separate it into two groups, so that they have:

Group 1: Garbage from the kitchen - like fruit and vegetable peels, egg shells, waste food, tea leaves. Include newspapers, dry leaves and paper bags in this group.

Group 2: Pieces of cloth, polythene bags, broken glass, aluminium wrappers, nails, old shoes and broken toys. Now divide the contents of each group into two separate heaps. Label them as A, B, C and D. Put one heap from Group 1 and one heap from Group 2 into two separate plastic bags. Tie the mouth of these two bags tightly. Put all the four heaps in separate pits and cover them with soil . You can also use four pots to bury these garbage heaps.

Fig. Putting garbage heaps in pits

Remove the soil after four days and observe the changes in the garbage. A black colour and no foul smell indicates that rotting of garbage is complete. Put the heaps again in the pits and cover with the soil. Observe again after every two days and note

your observations as suggested. Did the garbage.

i. rot completely and not smell?
ii. rot only partially?
iii. rot almost completely, but still smells bad?
iv. not change at all?

- Garbage in which heap was seen to rot and which did not?
- Enter options (i), (ii), (iii) or (iv) in the columns of Table based on your observations. Do not remove and burn the garbage that did not rot.

Garbage heap	After 4 days	After 6 days	After 2 weeks	After 4 weeks
A				
B				
C				
D				

ACTIVITY 2 :- Vermicompost

- Take a big container.
- Make sure temperature of the container should be moderate.
- Add a layer of sand in order to create a home for earthworms.
- Now, add little amount of water in sand to create some moisture.
- Then, add vegetable waste, animal waste, dry leaves etc in the container. Avoidadding salt, oil, pickle, milk products etc in it as they can harm earthworms.
- Add some earthworms.
- Now, keep adding and mixing the ingredients at regular intervals.
- Now, you will notice within a month, earthworms will be doubled.
- Then, place some vegetable waste in the corner of pit and as a result the entireearthworm will shift to the vegetable waste.
- Remove the compost from the vacated corner.
- Dark soil like vermicompost is ready to use

ACTIVITY 3 :- Recycling of Paper

Collect pieces of old newspapers, magazines, used envelopes, notebooks, or any other paper. Do not use shiny, plastic coated paper. You will also need a frame fitted with a wire mesh or a net. You can also use a large sized sieve in place of a frame. Tear the paper into small pieces. Put them in a tub or a bucket and pour water in it.

Let the pieces of paper remain submerged in water for a day. Make a thick paste of paper by pounding it. Now, spread the wet paste on the wire mesh fixed to the frame.

Pat it gently to make the thickness of the layer of the paste as uniform as possible. Wait till water drains off. If required, spread an old cloth or a sheet of newspaper on the paste to let it soak up the extra water. Now, carefully remove the layer of paste from the frame, spread it on a sheet of newspaper in the sun. Keep the corners of the newspaper sheet pressed by putting some weights so that these do not curl up. You can add food colour, pieces of dry leaves or flower petals or pieces of coloured paper in the paste before spreading it.

KEY WORDS:

1. GARBAGE : All the waste materials and other household waste produced on a daily basis are termed as garbage.

2. BIODEGRADABLE WASTES - The waste that can be converted into simple forms of carbon dioxide, oxygen, water or other forms such as compost by the action of microorganisms are called biodegradable

3. NON-BIODEGRADABLE WASTES - This waste cannot be broken down into simpler forms by microorganisms.

4. LANDFILL : Low lying Open Area where Different types of Garbage gets Separated.

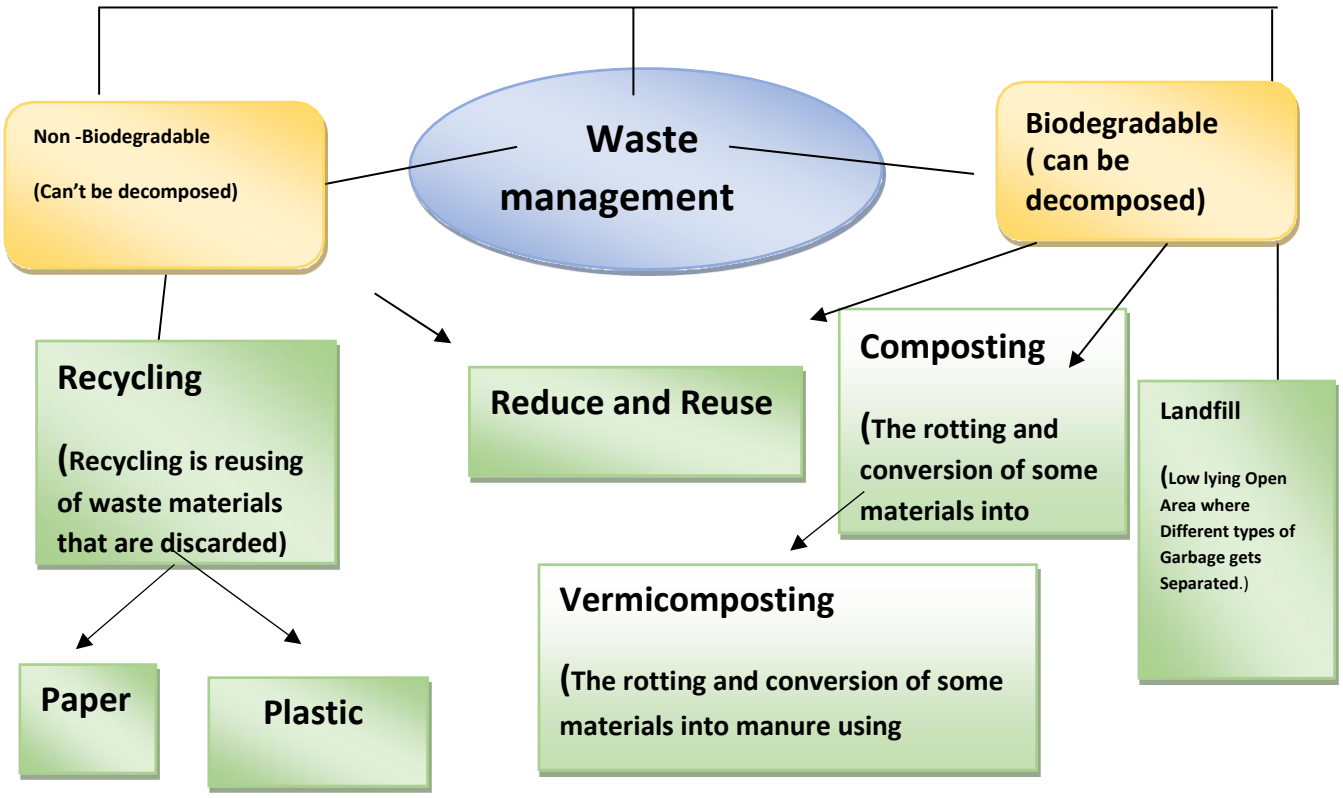
5. MANURE: Organic Matter that is used as a Natural Fertilizer for Plants which mainly Consists of Animal Excreta, Kitchen Waste, Green Waste, etc.

6. COMPOSTING: The rotting and conversion of biodegradable materials into manure.

7. VERMICOMPOSTING : It is the process of conversion of biodegradable waste into manure with the help of red worms.

8. RECYCLING : It is reusing of waste materials that are discarded.

MINDMAP



QUESTION BANK

MULTIPLE CHOICE QUESTIONS-

1. The method of preparing compost with the help of redworms is called

(a) Composting

(b) Vermicomposting

(c) Manuring

(d) decomposing Solution

Ans- (b) vermicomposting

2. If you dump kitchen waste in a pit, it may, after sometime

(a) convert into compost

(b) convert into vermicompost

(c) remain as such

(d) remain forever in its dried form.

Ans- (a) convert into compost

3. Which of the following activities does not reflect responsible behavior with regard to waste disposal?

(a) Goods carried in paper bags or cloth bags.

(b) Waste collected in polythene bags for disposal.

(c) Waste separated into those that degrade and those that do not.

(d) Making handicrafts with used up notebooks.

Ans- (b) Waste collected in polythene bags for disposal.

4. Chinki gave the following ill effects of the practice of burning dried leaves and other plant parts.

(i) Burning degrades the soil.
(ii) Burning produces harmful gases/fumes.
(iii) Precious raw materials to obtain manure at low cost is lost.
(iv) Lot of heat is generated unnecessarily.

The correct reasons of why we should not burn leaves are

(a) i, ii and iv only

(b) i, ii, iii and iv

(c) ii and iii only

(d) iii and iv only.

Ans- (b) i, ii, iii and iv

5. A garbage collector separate items mentioned below in the garbage into red, green and blue containers for their transfer to landfill, composting pit, and recycling unit respectively.

Items:

(i) Plastic bags
(ii) Newspaper and journals
(iii) Screw and nuts
(iv) Vegetable peels
(v) Metal chips
(vi) Egg shells

Which item was transferred to which bin?

	RED	GREEN	BLUE
(a)	(i) and (iv)	(ii) and (iii)	(v) and (vi)
(b)	(i) and (iii)	(ii) and (v)	(iv) and (vi)
(c)	(i), (iii) and (v)	(iv) and (vi)	(ii) only
(d)	(i) and (v)	(ii) and (iv)	(iii) only

Ans- (b)

(b)	(i) and (iii)	(ii) and (v)	(iv) and (vi)

6. Garbage from cities is collected at

(a) landfill areas

(b) riversides

(c) inside the ponds and lakes

(d) near every colony

Ans- **(a)** landfill areas

7. Which one can be used for making Manure ?

(a) Earthworms

(b) Houseflies

(c) Eagle

(d) Crow

Ans- (a) Earthworms

8. 3'R' means

(a) Reduce, reuse recycle

(b) rain, reuse and recycle

(c) rotting, reduce and reuse

(d) recycle, rain and rotting

Ans- (a) Reduce, reuse recycle

9. Which of the following structures help the red worms to grind their food?

(a) Mouth

(b) Tongue

(c) Teeth

(d) Gizzard

Ans- (d) Gizzard

10. Materials that can be recycled are collected in

(a) Red Bins

(b) Blue Bins

(c) Green Bins

(d) White Bins

Ans- (b) Blue Bins

VERY SHORT ANSWER TYPE QUESTIONS-

1. What are the uses of green coloured bins?

Ans- The green bins are for collecting kitchen and other plant or animal wastes.

2. List a few things we use that are made of plastics?

Ans- Toys, shoes, bags, pens, combs, tooth brushes, buckets, bottles, water pipes etc.

3. Where garbage collected by safai karamchari is dumped?

Ans- Garbage collected by safai karamchari is taken to a low lying open area, called a landfill.

4. What organism other than earthworm is involved in composting?

Ans- Microorganisms such as bacteria, fungi etc. is involved in composting.

5. What is paper-mâchè?

Ans- Paper-mâchè is a paste made of clay and waste paper used for moulding box, trays, basket etc.

6. Why banana leaf platter is a better option than plastic plate?

Ans- Banana leaf platter is a better option than plastic plate because it is cost effective and eco-friendly also it can be degraded to make compost.

7. Which living organism is used for making vermicompost?

Ans- Redworm is used for vermicomposting.

8. Can paper be recycled? Give reason

Ans- Yes, we can recycle paper to get new paper or cardboards.

9. Drains get choked due to_____thrown by us.

Ans- Plastics.

10. _____wastes could be converted into useful compost.

Ans- Biodegradable

SHORT ANSWER TYPE QUESTIONS:-

Q-1. Read the items mentioned in columns-I and II and fill in the related process in the column III.

Column I	Column II	Column III
(a) Organic waste	Redworms	(i) ……
(b) Garbage	Dig pit and fill with garbage	(ii) ……...
(c) Old newspaper	Paper bags	(iii) ……...

Solution:

Column I	Column II	Column III
(a) Organic waste	Redworms	(i) Vermicomposting
(b) Garbage	Dig pit and fill with garbage	(ii) Landfill
(c) Old newspaper	Paper bags	(iii) Recycling

Q-2. Correct the definitions of certain terms given below by changing only one word.

(i) Compost: Substances converted into manure for use in industries.
(ii) Landfill: Garbage buried under water in an area.
(iii) Recycling: Reuse of unused material in the same or another form.

Ans-
Compost: It is a process in which substances converted into manure for use in agricultural fields.
Landfill: It is a process in which garbage buried under soil in an area.
Recycling: It is a process in which reusing of used materials in the same or another form.

Q-3 Provide the suitable term that expresses the meaning of each of the following statements.

(a) Greeting cards made from newspaper.
(b) Contents of the waste bins.
(c) Redworms converting certain kinds of waste into manure.
(d) An area where a lot of garbage is collected, spread out and covered with soil.

Ans-

(a) Recycling
(b) Garbage
(c) Vermicomposting
(d) Landfill

Q-4. To what use can you put the following kinds of garbage and how?

(i) Rotting smelly garbage
(ii) Dry leaves collected in a garbage

Ans-

(i) Rotting smelly garbage is a biodegradable process. It can be converted into compost or vermicompost. Compost can be made by burying the organic waste such as fruit peels, vegetable peels, dry leaves etc. into a pit and covering it with soil. Vermicompost is made by using earthworms.

(ii) Dry leaves collected in a garbage can are converted into compost or vermicompost.

Q-5. Put a tick (✓) against the garbage items given in Table which could be converted into manure. Put a cross (X) against the other

S.No	Garbage Items	Make manure or not
(i)	Egg shells	
(iii)	Dry flowers	
(iv)	Pebbles	
(v)	Broken pieces of glass	
SOLUTION		
S.No	Garbage Items	Make manure or not
(i)	Egg shells	✓
(iii)	Dry flowers	✓
(iv)	Pebbles	X
(v)	Broken pieces of glass	X

Q-6 Why should we not burn plastic items? Give any two reasons

Ans- We should not burn plastic items because:(any two)

- On burning plastic, hazardous gases and fumes are emitted which are dangerous to human health and animals and also to the environment.
- Plastic is a non-biodegradable substance, so it cannot be easily burnt.
- Animals may consume the burnt pieces of plastic which may lead to their death by choking them.
- Burning plastic is not environment friendly it causes soil pollution and air pollution.

Q-7. Recently, a ban on plastic bags has been imposed in many places? Is the ban justified? Give reasons in two sentences.

Ans- Yes, a ban on plastic bags is justified because: (write any two)

(a) Plastic being non- biodegradable, it produces harmful gases on heating or burning. These gases may pollute the environment and causes many diseases for humans.
(b) Wastes are thrown using plastic bags onto roads or into rivers etc. when the animals eat the food along with the plastic bags it results in their death due to choking.
(c) Sewage system gets choked due to the blockage of waste in the drains. During heavy rains, it might even create a flood like situation

Q-8. Which one out of beetles, roundworm and earthworm are used for vermicomposting and why?

Ans- Earthworms convert waste from plants and animals or their products into compost. Hence earthworms are used for vermicomposting.

LONG ANSWER TYPE QUESTIONS

Q1. Read the poem written below and then answer the questions from the information gathered from the book or elsewhere.

Blue and Green
Two bins, you mean?
Yes, they are there
to throw your waste.
But not in a hurry
Nor in a haste.
Select from waste, sieve if seems muddy
Separate all items and when they are ready
Place in a blue bin, or one that is green
For a voyage to the landfill, or for composting.

(i) Name the two kinds of waste that need to be separated from each other in two different waste bins.
(ii) Name two items of waste each that need to be sent to a (a) landfill, (b) for composting

Ans- (i) The two kinds of waste that need to be separated from each other in two different waste bin are named as biodegradable waste and non-biodegradable waste.

The bin containing biodegradable waste can be converted into simpler forms with the help of microbes which can be used as manure. The bin containing non-biodegradable waste cannot be converted nor recycled. Hence the waste can be used for landfill.

(ii) The two items that can be sent to landfill are metal pieces, empty glass bottles, plastic plates etc. Wastes from kitchen like vegetable peels, dry leaves, animal dung etc can be sent for composting.

Q2. Beera, a farmer would clear his field every day, and burn dry leaves fallen on the ground. After some time he found that those living in huts near his field were suffering from cough and breathing problems.

(i) Can you explain why?
(ii) Also suggest an environment friendly way to dispose the dry leaves.

Ans- (i) Burning of dry leaves releases harmful fumes and gases which causes cough, breathing problems etc. People living in huts near Beera's field suffered from these problems as they inhaled the harmful fumes and gases released by the burning of dry leaves.

(ii) By the method of composting, dry leaves can be put in a pit and composed which is a method of preparing manure. It is an environment friendly way to dispose the dry leaves. Farmers can use this manure produced from the dry leaves in the agriculture fields.

Q3. The pie charts A and B shown in Fig. 16.1 are based on waste segregation method adopted by two families X and Y respectively.

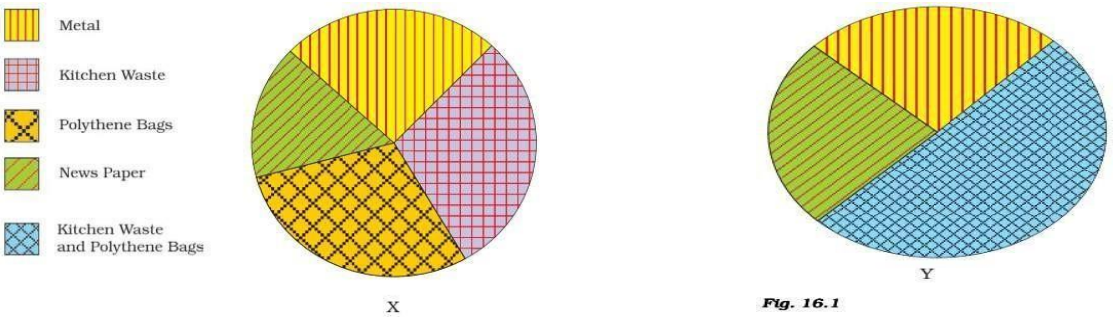


Fig. 16.1

Which of the two families X or Y do you think is more environmentally conscious and why?

Ans- Family X is more environmentally conscious because they segregated biodegradable and non-biodegradable substances separately. They are aware of disposing waste materials in a wrong manner. So, they disposed kitchen waste (biodegradable) and polythene bags (non-biodegradable) separately unlike family Y who disposed kitchen waste and polythene bags together as one waste.

Q4. Write 2 sentences on what comes to your mind when you chance to see the following.(any two)

(a) A rag picker.
(b) A cow eating a polythene bag.

Ans- **(a)** A rag picker

When we come across a rag picker, he represents poor people or under poverty people.

He sorts out the biodegradable waste from non- biodegradable waste.

He exposes himself to the harmful substances generated by the solid waste which causes various diseases.

(b) A cow eating a polythene bag

A cow eating a polythene bag is unsafe, it shows irresponsible behavior of citizens by throwing garbage in the form of polythene bag.

A cow is exposed to hazardous material generating from garbage.

A cow may choke itself from the polythene bag.

Q5. Beautiful hand crafted articles like boxes and toys are made of paper pulp in our country. Can you explain how paper pulp which is made from paper can be used to make hard boxes and other articles

Ans- Beautiful hand crafted articles like boxes and toys are made of paper pulp in our country.

Here are a few steps how it can be made:

The paper pulp obtained from paper is mixed with glue and saw-dust. Using glue and saw-dust we can make the paper hard. So, for making hard boxes, toys, etc. few coats of this hard pulp are applied over the framework. It is then allowed to dry up. Once the pulp is dried up, hard boxes and toys can further be processed. Hence the box is ready.

Q6. What happens when?

1. cooking medium is made to flow down a drain
2. insecticides, motor oil, paints are poured down the drain
3. Tea leaves, cotton swabs and old soft toys are thrown into the drain.

Ans- 1.When cooking medium is made to flow down a drain, it may choke the pipes causing drainage problem. And if the cooking medium reaches to the soil, it will clog the pores of the soil which decrease soil fertility and pollute soil.
2. When insecticides, motor oil and paints are poured down the drain, they may choke the pipes causing drainage problem. And if the discharge reaches the water bodies, it pollutes the water and may cause various harmful diseases in aquatic animals.
3. Tea leaves, cotton swabs and old soft toys are thrown into drains it may choke the pipes causing drainage problem. Hence water does not flow down the drains and starts leaking in public places polluting the environment.

CCT BASED QUESTIONS-

CASE-I

Garbage is a great environment hazard. It comes from various sources—used paper, tiffin packings, plastic bags, ice-cream wrappers, bottle caps, fallen leaves from trees and many more. Garbage makes the premises ugly, unkempt and breeds diseases. A lot of trash that is thrown away contains material that can be recycled and reused such as paper, metals and glass which can be sent to the nearest recycling centre or disposed of to the junk dealer. It also contains organic matter such as leaves which can enrich soil fertility. A compost pit can be made at a convenient location where the refuse can be placed with layers of soil and an occasional sprinkling of water. This would help decomposition to make valuable fertilizer. This would also prevent pollution that is usually caused by burning such organic waste.

ANSWER THE FOLLOWING QUESTIONS-

Q1. Garbage originates from

(a) used paper, tiffin, packings, plastic bags and fallen leaves from trees

(b) leftovers of food

(c) fallen branches from trees

(d) Building materials.

Ans- (a) used paper, tiffin, packings, plastic bags and fallen leaves from trees

Q2. Which of these is correct with reference to a composite pit?

(a) The refuge is placed with layers of soil with an occasional sprinkling of water
(b) It contributes to the manufacture of useful fertilizer
(c) It prevents pollution
(d) All the above.
Ans- (d) All the above.

Q3. Fallen leaves from trees are useful because they
(a) solve the problem of fuel wood in village households
(b) enrich water quality
(c) Enrich soil fertility
(d) beautify landscape.
Ans- (c) Enrich soil fertility

CASE-II

SWATCH BHARAT MISSION-A STEP TOWARDS HEALTHY INDIA

To accelerate the efforts to achieve universal sanitation coverage and to put the focus on sanitation, the Prime Minister of India had launched the Swachh Bharat Mission on 2nd October 2014. Under the mission, all villages, Gram Panchayats, Districts, States and Union Territories in India declared themselves "open-defecation free" (ODF) by 2 October 2019, the 150th birth anniversary of Mahatma Gandhi, by constructing over 100 million toilets in rural India..

To ensure that the open defecation free behaviours are sustained, no one is left behind, and that solid and liquid waste management facilities are accessible, the Mission is moving towards the next Phase II of SBMG i.e ODF-Plus. ODF Plus activities under Phase II of Swachh Bharat Mission (Grameen) will reinforce ODF behaviours and focus on providing interventions for the safe management of solid and liquid waste in villages.

ANSWER THE FOLLOWING QUESTIONS-

Q1. Swachh bharat Mission Concept was developed with the inspiration of which Indian leader ?

a) Rajiv Gandhi
b) Mahatma Gandhi
c) Sardar Vallabhai Patel
d) Pd. Jawahar lal Nehru

Ans- (b) Mahatma Gandhi

Q2. See the table given below regarding percentage of rural population not using toilets in 2015 and 2018 answer the questions that follows:

State	Percentage of rural population not using toilets	
	NSSO 72nd Round (2015)	NSSO 75th Round (2018)
India	**52%**	**33%**
Uttar Pradesh	66%	58%
Jharkhand	81%	49%
Bihar	70%	53%
Odisha	73%	47%
Chhattisgarh	68%	15%

The following states are arranged in order of first, second and third with respect to non usage of individual toilets in 2018. Choose the correct order

a) Chattisgarh, orissa, Jharkhand
b) Uttarpradesh, Orissa, Bihar
c) UttarPradesh, Bihar, Jharkhand
d) Bihar , uttarpradesh, Jharkhand

Ans- (c) UttarPradesh, Bihar, Jharkhand

Q3. **Statement 1:** ODF Plus activities under Phase II of Swachh Bharat Mission (Grameen) will reinforce ODF behaviours and focus on providing interventions for the safe management of solid and liquid waste in villages

Justify the statement and give suitable reasons why solid and liquid waste management is necessary in villages.

Ans- To bring improvement in cleanliness, hygiene and the general quality of life in rural areas.

NCERT Exercises

1. (a) Which kind of garbage is not converted into compost by the red worms?

(b) Have you seen any other organism besides red worms, in your pit? If yes, try to find out their names. Draw pictures of these.

Solution:

a) Pieces of cloth, polythene bags, broken glass, aluminium wrappers, nails and broken toys are not converted into compost by the red worms.

b) Earthworms, small insects like ant, millipedes are found in pits.

2. Discuss:

(a) Is garbage disposal the responsibility only of the government?

(b) Is it possible to reduce the problems relating to disposal of garbage?

Solution:

a) No, not just the government, but everybody is responsible for garbage disposal. We should bifurcate wet and dry waste, recycle the non-biodegradable substances and we should also reduce the accumulation of garbage in our house and streets.

b) Yes, it is possible to reduce the problems of garbage by scientific disposal of garbage, we can do it by bifurcation of different waste and also by recycling the waste materials.

3. (a) What do you do with the leftover food at home?

(b) If you and your friends are given the choice of eating in a plastic plate or a banana leaf platter at a party, which one would you prefer and why?

Solution:

(a) Leftover food can be collected and used to form compost. Compost produces nutrients necessary for the growth and development of plants.

(b) We would prefer to eat food on a banana leaf plate because it acts as a harmless substance which helps to form manure by the process of composting, whereas plastic plates cannot be converted into harmless substances by composting. Plastic plates are not degradable, hence can persist in the environment and cause many problems.

4. (a) Collect pieces of different kinds of paper. Find out which of these can be recycled.

(b) With the help of a lens look at the pieces of paper, you collected for the above question. Do you see any difference in the material of recycled paper and a new sheet of paper?

Solution:

(a) Papers such as newspapers, notebooks, magazines can be recycled easily. However, shiny and coated papers cannot be easily recycled

(b) Recycled paper is usually thick or rough when compared to a new sheet of paper.

5. (a)Collect different kinds of packaging material. What was the purpose for which each one was used? Discuss in groups.

(b) Give an example in which packaging could have been reduced?

(c) Write a story on how packaging increases the amount of garbage.

Solution:

(a) Different kinds of packaging materials used commonly are:

Cardboard – used as shoe, soap, bulb and other boxes.

Plastic Bags – Toys covers, sarees bags, shopping bags, etc.

Wooden Boxes – Fruit baskets and boxes for hardware.

Jute Bags – School bags, shopping bags, vegetable bags, etc.

(b) By reusing the packaging material, we can reduce the accumulation of garbage.

(c) The basic purpose of packaging is to protect the product from tampering and to maintain its freshness and purity. However, most of the packaging material is used to beautify the boxes and make them look attractive on the shelves. Unfortunately, a large volume of packaging material goes waste and is thrown into the dustbin.

For example, in most of the places, the dustbins are full of chips and biscuit wrappers.

It unnecessarily increases the amount of garbage. It also increases the cost of the product due to unnecessary packaging. We should seriously consider how to reduce unnecessary packaging.

6. Do you think it is better to use compost instead of chemical fertilizers? Why?

Solution:

Yes, it is better to use compost instead of chemical fertilizers for the following reasons:

- It is easy to prepare compost
- Compost is environment friendly as it does not cause any health issues in humans and animals
- Compost will not cause pollution
- Compost increases soil fertility.
- Compost is biodegradable

BLUE - PRINT

KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

SESSION ENDING EXAMINATION 2021-22

CLASS –VI

SUBJECT – SCIENCE

TIME: 2 HRS **MAX. MARKS:40**

S. NO.	NAME OF THE CHAPTER	OBSERVATION AND REPORTING (10)	IDENTIFICATION AND CLASSIFICATION (10)			DISCOVERY OF FACTS (10)			APPLICATION AND SKILL BASED QUESTIONS INCLUDING DRAWING AND LABELLING (10)		TOTAL (40)
		OBJECTIVE QUESTIONS (1)	VSA (1)	SA (2)	LA (4)	VSA (1)	SA (2)	LA (4)	SA (2)	LA (4)	
1.	11. LIGHT , SHADOWS AND REFLECTION	1 (1)			1 (4)		1 (2)				3(7)
2.	12. ELECTRICITY AND CIRCUIT	1 (1)	1 (1)					1 (4)	1 (2)		4 (8)
3.	13. FUN WITH MAGNETS	2 (1)		1 (2)					1 (2)		4 (6)
4.	14. WATER	2(1)				1 (1)				1 (4)	4 (7)
5.	15. AIR AROUND US	2(1)		1 (2)			1 (2)				4 (6)
6.	16. GARBAGE IN, GARBAGE OUT	2 (1)	1 (1)			1 (1)			1 (2)		5 (6)
	NO. OF QUESTIONS (TOTAL MARKS)	10 (10)	2 (2)	2 (4)	1 (4)	2 (2)	2 (4)	1 (4)	3 (6)	1 (4)	24 (40)

KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

SESSION ENDING EXAM/ TERM END PAPER (2021-22)

CLASS – VI

SUBJECT – SCIENCE

MODEL QUESTION PAPER – 1

TIME: 2 HRS. **M.M.: 40**

GENERAL INSTRUCTIONS: -

i) There are a total of 24 questions and all questions are compulsory.

ii) There is no overall choice, however an internal choice has been provided in some of the questions.

iii) This paper contains four sections; A, B, C and D.

iv) Questions 1 to 10 are objective type (SECTION A) carry one mark each (10)

v) Questions 11 to 14 are very short answer type (SECTION B) and carry one mark each (04)

vi) Questions 15 to 21 are short answer type (SECTION C) and carry two marks each (14)

vii) Question 22 to 24 are long answer type (SECTION D) carry four marks each(12)

viii) There are some questions for visually impaired students which should beattempted by them only.

ix) Wherever required draw neat and labelled diagrams.

SECTION-A

Q1. Water is used for_____.

(a) Bathing

(b) Cooking

(c) Drinking

(d) All of these

Q2. Which is an example of a magnetic substance?

(a) Iron
(b) Nickel
(c) Cobalt
(d) All of these

Q3. Which of the following is a non-conductor of electricity?

(a) Battery
(b) Rubber glove
(c) Metal spoon
(d) Coin

OR

A bulb whose filament is broken is called

(a) fused
(b) glowing
(c) conductor
(d) none of these

Q4. Materials that can be recycled are collected in

(a) Red bins
(b) Blue bins
(c) Yellow bins
(d) White

Q5. Light is a form of energy that makes the objects:

(a) Visible
(b) Invisible
(c) Both (a) and (b)
(d) None of these

OR

Light travels in_____.

(a) straight line
(b) curved line
(c) zig-zag line

(d) randomly

Q6. Which among the following will not pollute the soil?

(a) Aluminum foil
(b) Plastic
(c) Thermo Col
(d) Bread

Q7. Envelope of air that surrounds the earth is known as

(a) biosphere
(b) atmosphere
(c) environment
(d) ecosystem

Q8. Heavy rains may cause _____

(a) floods
(b) drought
(c) rainlessness
(d) both (a) and (c)

Q9. Wind does not help in the movement of

(a) firki
(b) weather cock
(c) ceiling fan
(d) sailing yacht

Q10. A compass needle always points in a direction

(a) North-South

(b) East-west

(c) North- East

(d) Direction cannot be determined

SECTION-B

Q11. Which living organism is used for making compost?

Q12. Name two main processes which transfer water present on the earth into

water vapour continuously.

Q13. State whether the following statements are true or false.

i. Plastics are eco-friendly.

ii. Garbage heaps of dried leaves should not be burnt.

Q14. Fill in the blanks.

(a) An electric cell has_____terminals.

(b) Name a gadget in which electric cell is used.

OR

Name two electrical gadgets that have switches built into them.

SECTION-C

Q15. Draw the diagram of:

(a) Bar magnet

(b) Horse-shoe magnet

Q16. Name the major constituents of air.

Q17. Draw an electric circuit with a dry cell, switch and glowing bulb.

OR

What is a switch. Draw a simple switch by using drawing pin and safety pin.

Q18. Pick four materials objects of which can be recycled.

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

Q 19. Categorise the given substances into two groups-magnetic and non-magnetic.

Key, Nail, Rubber, Sand,

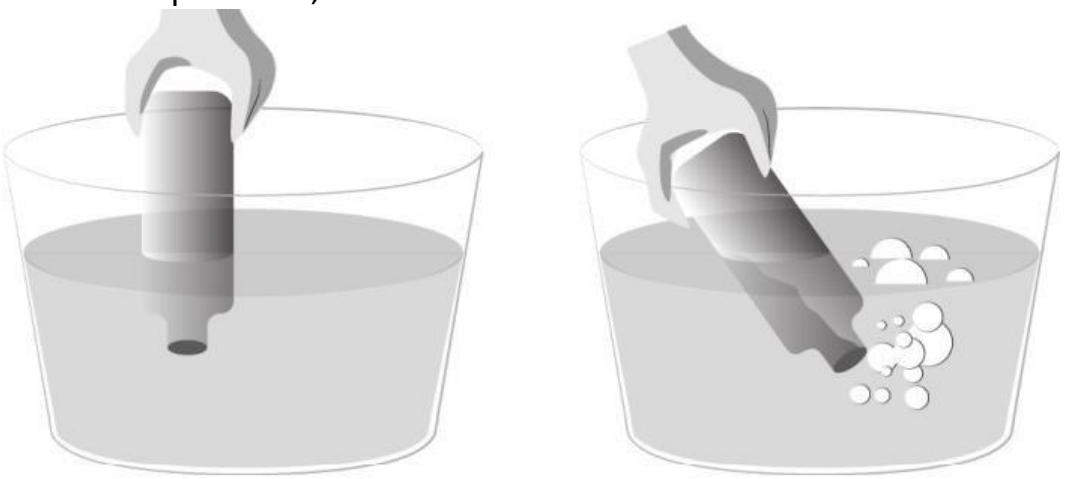
Q 20 What is a shadow ? how is it formed.

OR

Match the following

a. Moon	i. Formed due to reflection by mirrors
b. Image	ii. Sending back of light by a shiny surface
c. Reflection	iii. Phenomenon of changing left to right
d. Lateral Inversion	iv. Is nonluminous

Q21. A student performs an experiment to show the presence of air. He takes and empty bottle and dips in a water in two different positions, one by one, as shown.
Based on the experiment, what can be concluded?



SECTION-D

Q22 i. What do you mean transparent, translucent and opaque materials.

ii. Give example of a luminous source of light which is a

a) living body

b) nonliving object

OR

a. Write two differences between transparent and opaque materials.
b. Classify the following as transparent and opaque.

Water, stone, leaf, glass.

Q23. Draw a neat well labelled diagram to show Water Cycle.

OR

What is rain water harvesting. Draw a diagram to show rainwater harvesting.

Q24. a. Distinguish between conductors and insulators.

b. Why is the handle of electrician's screw driver made of plastic?

OR

a. What is conduction tester.

b. Select conductors and insulators from the following

Pin, notebook, chalk, duster, comb, key

FOR VISUALLY IMPAIRED STUDENTS

Q15 Define (a) Magnetic material (b) Nonmagnetic material

What is an electric circuit? What is the direction of the current in the electric circuit?

OR

What is a cell? How is electricity produced by an electric cell?

Q.17 Name four materials objects made of which can be recycled.
Q.21 Describe an activity to show that air occupies space.
Q.23 Describe water cycle

OR

What is rain water harvesting. Write its two advantages.

KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

SESSION ENDING EXAM/ TERM END PAPER (2021-22)

CLASS – VI

SUBJECT – SCIENCE

MODEL QUESTION PAPER – 2

TIME: 2 HRS. **M.M.: 40**

GENERAL INSTRUCTIONS: -

i) There are a total of 24 questions and all questions are compulsory.

ii)There is no overall choice, however an internal choice has been provided in some of the questions.

iii) This paper contains four sections; A, B, C and D.

iv) Questions 1 to 10 are objective type (SECTION A) carry one mark each (10)

v)Questions 11 to 14 are very short answer type (SECTION B) and carry one mark each (04)

vi) Questions 15 to 21 are short answer type (SECTION C) and carry two marks each (14)

vii) Question 22 to 24 are long answer type (SECTION D) carry four marks each(12)

viii) There are some questions for visually impaired students which should be attempted by them only.

ix) Wherever required draw neat and labelled diagrams.

SECTION-A

Q1- Paheli observed the shadow of a tree at 8:00 am, 12:00 noon and 3:00 pm. Which of the following statements is closest to her observation about the shape and size of the shadow?

(a)- The shape of the shadow of the tree changes but the size remains the same.

(b) The size of the shadow of the tree changes but the shape remains the same.

(c)-Both the size and shape of the shadow of the tree change.

(d) – Neither the shape nor the size of the shadow changes.

OR

When we pass under a tree covered with large number of leaves, we notice small patches of sunlight under it. These circular images are, in fact, pin hole images of the Sun.

Which of the following act as pinhole in the Natural Pinhole camera?

(a) Leaves acts as pinhole b) Gaps between the leaves

(c) Water droplets (d) Both a and b

Q2- Filament of a torch bulb is

(a) a metal case

(b)- metal tip at the center of the base.

(c)- two thick wires

(d) a thin wire

OR

We change the electric cells when our electric devices stop working. The reason behind this is-

(a)- There may be some fault in electric device.

(b)- The chemical energy in electric cells get used up after working.

(c)- There may be some fault in switch .

(d)- All the above.

Q3- A magnet was broken in five pieces. How many North poles will be present in broken pieces?

(a) 10 (b) 5 (c) 0 (d) 2

Q4- Magnet attracts

(a)- Wood (b)- Plastic (c)- Paper (d) Iron

Q5-Take two similar plates. Place plate A in Sunlight and keep the other plate B under shade. Now pour equal amount of water in the plates and observe them after half an hour-

(a) Plate A will have more water than plate B.

(b) Plate B will have less water than plate A.

(c) Plate A will have less water than Plate B.

(d) None of the above.

Q6- In our country, most of the rain fall occurs during the ---------- season.

(a) Summer (b) Winter (c) Monsoon (d) Spring

Q7- Mountaineers carry cylinders with them-

(a) Carbon dioxide (b) Nitrogen (c) Water (d) Oxygen

Q8- Breathing of air through our mouth is not hygienic because

(a) Dust particles may enter our lungs.

(b) We will inhale more carbon dioxide.

(c) Our throat will become sore.

(d) We will easily catch cold.

Q9- What could be the ideal replacement for a plastic bag?

(a) Paper bags (b) Cloth bags (c) Jute bags (d) All the above

Q10- There are two pits A and pit B. In pit A, garbage from kitchen like fruits and vegetables peels, egg shells, waste food and some soil with Red worms while in pit B there are polythene bags, broken glass , Aluminium wrappers , broken plastic toys. What kind of changes you will observe in the pits after few weeks?

(a) There will be no change in two pits.

(b) The garbage in both pits will rot completely.

(c) The garbage in pit A will rot while in pit B it will not rot.

(d) The garbage in pit B will rot while in pit A it will not rot.

or

Which of the following wastes can be recycled?

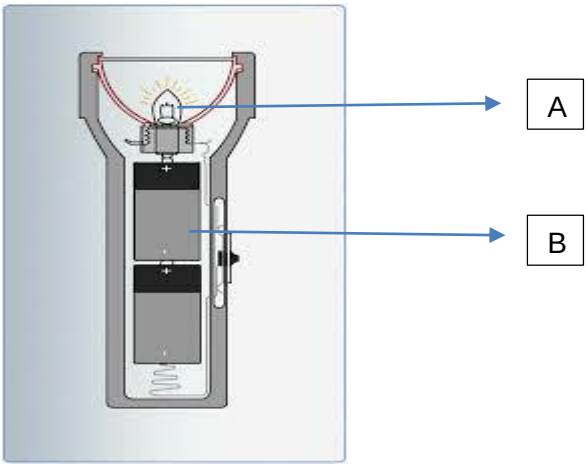
(a) Plastic (b) Onion peel

(c) Egg shells (d) Banana peel

SECTION B

Q11- Boojho has drawn the inside of the Torch as in figure. When we close the switch, the circuit is completed and the bulb glows. He labelled various parts of Torch but forgot to label two parts A and B. Write name of these two parts.

FIGURE-



Q12- Name the term for the following statement-

The process of loss of water in the form of water vapours from the leaves of plants through stomata.

Q13-What are the three 'R' that everyone should follow to save the environment?

Q14- Identify the term used for the following statement-

The substance which of formed by decomposition of dead organic matter of living organisms.

OR

The substances which can be decomposed by bacteria.

SECTION C

Q15- Explain an activity that light travels in a straight line and gets reflected from a

mirror.

Q16- Column A shows different positions in which one pole of a magnet is placed near that of the other. Column B indicates the resulting action between them for each situation. Fill the blanks.

COLUMN A	COLUMN B
(i) N - N	(a) ----------
(ii) N- -----	(b) Attraction
(iii) S - N	(c) ----------
(iv) ---- S	(d) Repulsion

Q17-Complete the drawing shown in figure to indicate where the free ends of the two wires should be joined to make the bulb glow.

Figure-

Q18- A bar magnet has no markings to indicate its poles. How would you find out near which end is its North pole located?

Or

How is a compass used to find directions?

Q19- Name the major constituents of Air. Write the percentage of the constituents also.

Or

When the open mouth of an empty bottle is tilted in a bucket filled with water, we see bubbles coming out of it. Write the reason behind this phenomenon.

Q20- Do you think it is better to use compost instead of chemical fertilizers? why?

Q21- Match the column A with column B.

COLUMN A	COLUMN B
(i) Atmosphere	(a) Supports combustion.
(ii) Carbon dioxide gas	(b) Thin layer of air surrounding our Earth
(iii) Nitrogen gas	(c) Released in respiration
(iv) Oxygen gas	(d) does not help in combustion.

SECTION D

Q22- Draw a well labeled of water cycle. Show the process of evaporation, condensation, precipitation with the help of arrows.

Or

Define Roof top rain water harvesting. Draw a well labeled diagram of rooftop rain water harvesting.

Q23- (a) Differentiate between Luminous and non-luminous objects with two examples each.

(b)- In a completely dark room, if you hold up a mirror in front of you, will you see a reflection of yourself in the mirror?

Or

(a) Differentiate between Transparent material, Translucent material and opaque material with one example each.

(b)- Can you think of creating a shape that would give a circular shadow if held in one way and a rectangular shadow if held in another way?

Q24- (a)- Using the ‘conduction tester ‘on an object, it was found that the bulb begins to glow. Is that object a conductor or an insulator? Explain.

(b)- The handles of the tools like screwdrivers and pliers used by electricians for repair work usually have plastic or rubber covers on them. Write the reason behind this.

OR

(a)-Would the bulb glow after completing the circuit shown in figure if instead of

safety pin, we use an eraser?

FIGURE –

(b)- What is the purpose of using an electric switch?

(c)-Write the direction of current in electric circuit.

FOR VISUALLY IMPAIRED STUDENTS IN LIEU OF QUESTION- (11, 17, 22 , 24)

Q11- Out of Aluminium foil, Paper, dry cloth and rubber sheet, which is the good conductor?

Q17- In any electric circuit, when the switch is on and the current flows through it.

Why do the wire , switches , bulbs or devices become hot?

Q22- State for each of the following whether it is due to evaporation or condensation-

(a) – Water drops appear on the outer surface of a glass containing cold water.

(b)- Steam rising from wet clothes while they are ironed.

(c) Fog appearing on a cold winter morning.

(d) Blackboard dries up after wiping it.

OR

Explain two techniques of rain water harvesting.

Q24- a)- Using the ‘conduction tester ‘on an object, it was found that the bulb begins to glow. Is that object a conductor or an insulator? Explain.

(b)- The handles of the tools like screwdrivers and pliers used by electricians for repair work usually have plastic or rubber covers on them. Write the reason

behind this.

OR

(a)- Name the closed path through which current flows between the two terminals of the electric cell.

(b)- Write the direction of current in the closed path.

(c)- What is the purpose of using switch in electrical gadgets?

KENDRIYA VIDYALAYA SANGATHAN, DELHI

REGIONSESSION ENDING EXAM/ TERM END

PAPER (2021-22)

CLASS – VI

SUBJECT – SCIENCE

MODEL QUESTION PAPER – 3

TIME: 2 HRS. **M.M.: 40**

GENERAL INSTRUCTIONS: -

i) There are a total of 24 questions and all questions arecompulsory.

ii)There is no overall choice, however an internal choice has been provided insome of the questions.

iii) This paper contains four sections; A, B, C and D.

iv) Questions 1 to 10 are objective type (SECTION A) carry one mark each (10)

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vii) Question 22 to 24 are long answer type (SECTION D) carry four marks each(12)

viii) There are some questions for visually impaired students which should beattempted by them only.

ix) Wherever required draw neat and labelled diagrams.

SECTION-A

Q1- Four students A, B,C and D looked through pipes of different shapes to see a candle flame as shown in figure:

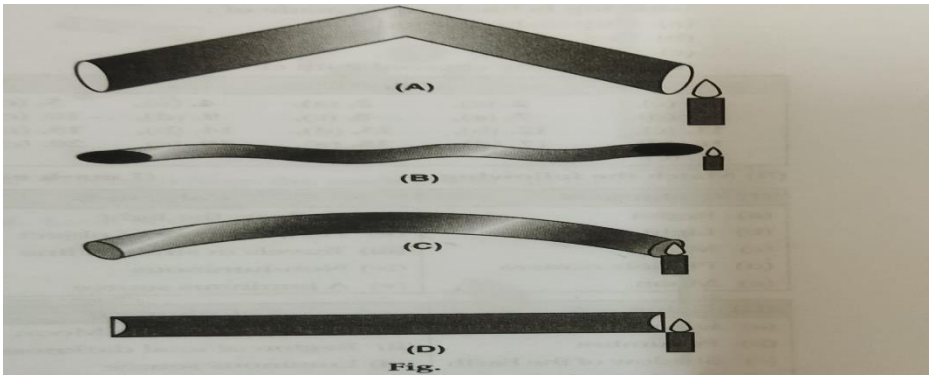


Fig.

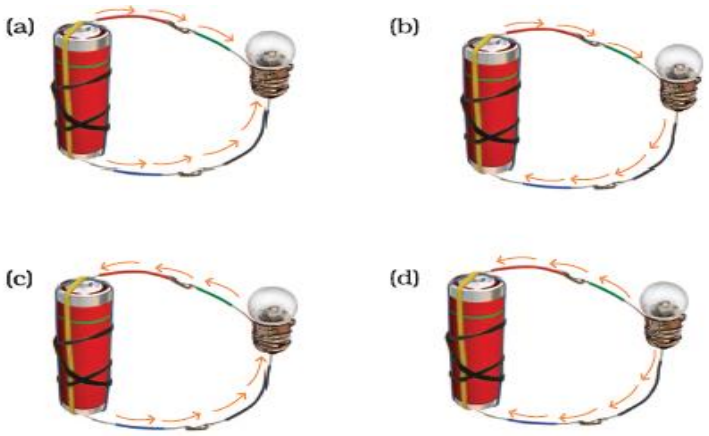
Who will be able to see the candle flame clearly?

a) A
b) B
c) C
d) D

Q2. The number of poles that a magnet has:

a) One
b) Two
c) Three
d) Many

Q3. Observe the given diagrams. Which one shows the correct direction of the current?



a) Fig. (a)
b) Fig. (b)
c) Fig. (c)
d) Fig. (d)

Q4. In a magnet, the regions of maximum attraction are:

a) All over the body
b) At the two ends of the magnet
c) At any one end of the magnet
d) At the center of the magnet

Q5. When we spread our wet clothes in the sun, the water:

a) Transpires
b) Respires
c) Transports
d) Evaporates

Q6. For using ground water, man uses:

a) Canals
b) Dams
c) Tube wells
d) None of these

Q7. What is not true about air?

a) It makes the windmill rotate.
b) It helps in the movements of aeroplanes.
c) Birds can fly due to presence of air.
d) It has no role in water cycle.

Q8. Fish drive oxygen from:

a) The soil below water.
b) The dissolved air in water.
c) The atmospheric air.
d) None of these.

Q9. Paheli gave the following ill effects of the practice of burning dried leaves and other plant parts:

i) Burning degrades the soil
ii) Burning produces harmful gases/ fumes
iii) Precious raw materials to obtain manure at low cost are lost.
iv) Lot of heat is generated unnecessarily.

The correct reasons of why we should not burn leaves are:

a) (i), (ii) and (iv) only
b) (i), (ii),(iii) and (iv)
c) (ii) and (iii) only
d) (ii), (iii) and (iv) only

Q10. Which of the following can be recycled?

a) Plastics
b) Kitchen waste
c) Leather
d) Animal waste

SECTION- B

Q11. Write the name of any two objects which are insulator .

Q12. Scarcity of water for a longer period of time in an area can cause_____.

Q13. Write True / False for the following statements:-

i) Toxic wastes have an adverse effect on nature and wildlife.
ii) Even if a piece of plastic is left underground for many years, it will not decay.

Q14. What is vermi composting?

SECTION- C

Q15. Draw a diagram of closed circuit and label it.

OR

Draw a diagram of a battery labelling its terminals.

Q16. Draw the different types of magnets and write their names.

Q17. What is the composition of air?

Q18. In a completely dark room, if you hold a mirror, will you see a reflection of yourself in the Mirror?

Q19. Name any two magnetic and two non-magnetic materials.

Q20. List any four activities that are possible due to presence of air.

OR

Suppose you want to dry your school uniform quickly. Would spreading it near an angithi help. If yes, how?

Q21. Read the item mentioned in Column I and II and fill in the related process in the Column III

Column I	**Column II**	**Column III**
a) Organic Waste	Redworms	i) _____
b) Garbage	Dig pits and fill with garbage	ii) _____

SECTION- D

Q22. Figure A and B, show a bulb connected to a cell in two different ways.

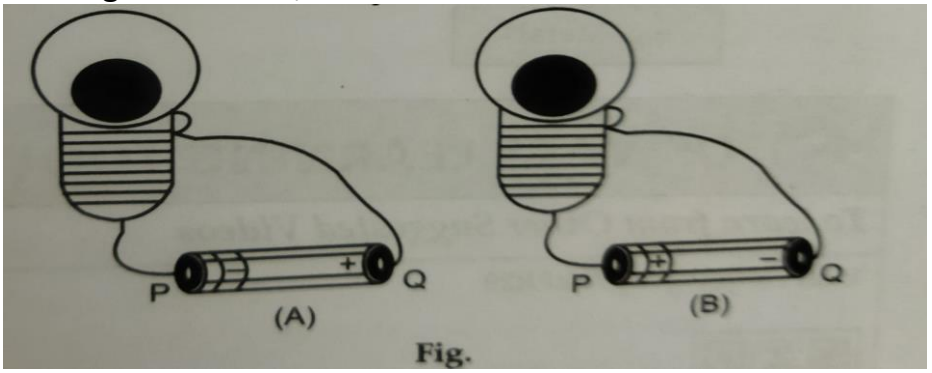


Fig.

i)What will be the direction of the current through the bulb in both the cases?(Q to P

or P to Q)
ii)Will the bulb glow in both the cases?
iii)Does the brightness of the glowing bulb depend on the direction of current through it?

Q23. i) Distinguish between transparent , translucent and opaque objects. Give two example of each.
ii) Name a living luminous source of light.
Q24. Draw a diagram of water cycle.

OR

Explain the process of rooftop rain water harvesting with the help of suitable diagram.

For Visually Impaired Students Only

1. Shadow of a red object will be:
a) Red
b) White
c) Yellow
d) Black

3. An electric cell can generate electric current in a/ an:
a) Open circuit
b) Closed circuit
c) Both of these
d) None of these

Q15. Why should an electrician use rubber gloves while repairing an electrical switch?

OR

A fused bulb does not glow. Why?

Q16. Give two reasons by which magnet lose their magnetic properties.

Q22. What is an electric switch? What is its use? Give two examples of electrical appliances where electric switches are used.

Q24. Define water cycle. How does it works?

OR

How can we conserve water? (State any three ways) Write any two activities which require more than a bucket of water.

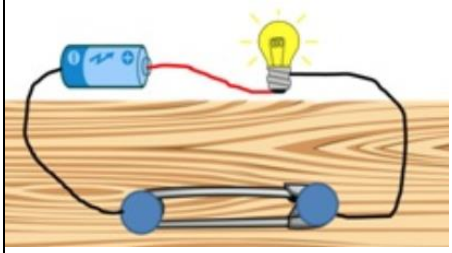
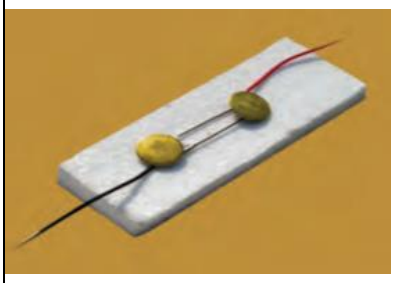
KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

SESSION ENDING EXAM/ TERM END PAPER (2021-22)

CLASS – VI
SUBJECT – SCIENCE
SET-1

ANSWER KEY

S. No.	Answers	Marks
1.	d. all of these	1
2.	d. All of these	1
3.	b. Rubber gloves **OR** a.Fused	1
4.	b. Blue bins	1
5.	a. Visible **OR** a. Straight line	1
6.	d. Bread	1
7.	b. Atmosphere	1
8.	a. Floods	1
9.	c. ceiling fan	1
10.	a. North-south	1
11.	Earthworm/Redworm	1
12.	Transpiration and Evaporation	½ + ½
13.	i. False ii. True	½ + ½
14.	a. 2/two b. Torch, Radio (any one of correct example) **OR** Torch, radio, television (Any two correct examples)	½ mark for each correct answer

15.	a. Correct diagram of bar magnet b. Correct diagram of horse-shoe magnet	1+1
16.	Nitrogen, Oxygen, Carbon Dioxide, Dust particles, Inert gases	2
17.	 OR **Electric Switch** is an electrical device which can make or break an electric circuit. 	2
18.	Plastic, glass, paper, metal	2 (½ mark for each correct answer)
19.	Magnetic- Key, Nail Nonmagnetic- Rubber, sand	½ mark for each correct answer
20.	An area of darkness formed by an opaque object obstructing light is called a shadow. A shadow is formed when an opaque object blocks the light falling on it. **OR** a. Moon iv is nonluminous b. Image i formed due to reflection by mirror c. Reflection ii sending back of light by a shiny surface d. Lateral inversion iii phenomenon of changing left into right	1+1 **OR** ½ X 4

<table>
<tr><td>21.</td><td>Air comes out from the bottle as bubbles. then water enters in the bottle
It shows that air occupies space</td><td>1

1</td></tr>
<tr><td>22.</td><td>i) Those objects which allow light rays to pass through them completely are called transparent objects.

Those objects which allow only a small part of the light rays to pass through them are called translucent objects.

Those materials which do not allow light to pass through them, are called opaque objects.

ii) a)Jugnu/Firefly
b) Sun/Bulb/ or any other correct answer
OR

a.
OR
<table><tr><td>TRANSPARENT OBJECTS</td><td>OPAQUE OBJECTS</td></tr><tr><td>Allow light to pass through them</td><td>Do not allow light to pass through them</td></tr><tr><td>Do not form shadow</td><td>Form Shadow</td></tr></table>
ANY OTHER CORRECT DIFFERENCE
b. Transparent- Water, Glass
Opaque- Stone, Leaf</td><td>3+1

OR

2+2</td></tr>
<tr><td>23.</td><td>Diagram of water cycle with correct labeling.
OR
Rain water harvesting is collection and storage of rain water that runs off from roof tops, parks, roads, open grounds, etc. This water run off can be either stored or recharged into the ground water.

Diagram of Rain water harvesting</td><td>2+2</td></tr>
</table>

<table>
<tr><td>24.</td><td>a.
<table><tr><td>CONDUCTOR</td><td>INSULATOR</td></tr><tr><td>A conductor allows current to flow easily through it.</td><td>An Insulator doesn’t allow current to flow through it.</td></tr><tr><td>Conductors are used in making electrical equipment.</td><td>Insulators are used in insulating electrical equipment for safety purpose.</td></tr></table>
b. Because plastic is an insulator thus it protects the user's hands from the risk of electric shock

OR
a. A conduction tester is a device with a bulb that can be used to determine whether an object is a good conductor or not

b. Conductors- Pin, Key
Insulators- Notebook, Chalk, Duster</td><td>2+2

OR
1

3</td></tr>
<tr><td></td><td>FOR VISUALLY IMPAIRED</td><td></td></tr>
<tr><td>15</td><td>(a) Materials which get attracted towards magnet are called Magnetic materials
(b) Materials which do not get attracted towards magnet are called Non-Magnetic materials</td><td>1+1</td></tr>
<tr><td>17</td><td>The electric circuit provides a complete path for electricity to pass (current to flow) between the two terminals of the electric cell.
In an electric circuit, the direction of current is taken to be from the positive to the negative terminal of the electric cell
OR
Electric cell is a source of electricity.
An electric cell produces electricity from the chemicals stored inside it.</td><td>1+1</td></tr>
</table>

18	Plastic, glass, paper, metal **OR** any other correct answer	½ X 4
21	Take an **empty glass bottle**. Now, dip the open mouth of the bottle into a bucket filled with water. You will notice that water does not enter the bottle when it is in an inverted position, as there is no space for air to escape. This activity shows that air occupies space.	2
23	The constant circulation of water is known as the water cycle. The water in seas, rivers, lakes, ponds or streams evaporates because of the heat of the sun. Plants also give out large amounts of water from their leaves. The water vapour rises up. The air higher up in the atmosphere is cooler. This cools the water vapour and condenses to form tiny drop of water and form clouds. As the clouds get cooled further, the water drops become bigger and heavier and fall on the earth as rain . **OR** Rain water harvesting is collection and storage of rain water that runs off from roof tops, parks, roads, open grounds, etc. This water run off can be either stored or recharged into the ground water. ADVANTAGES: - Increases ground water - Helps in overcoming water shortage OR ANY OTHER CORRECT ANSWER	2+2

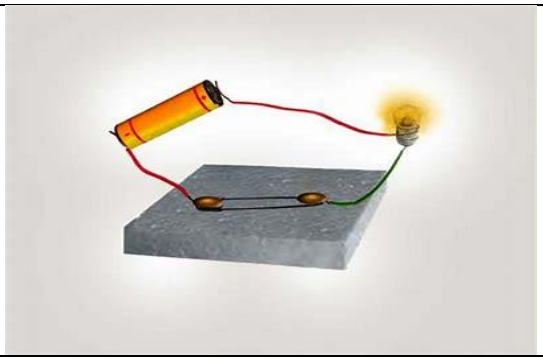
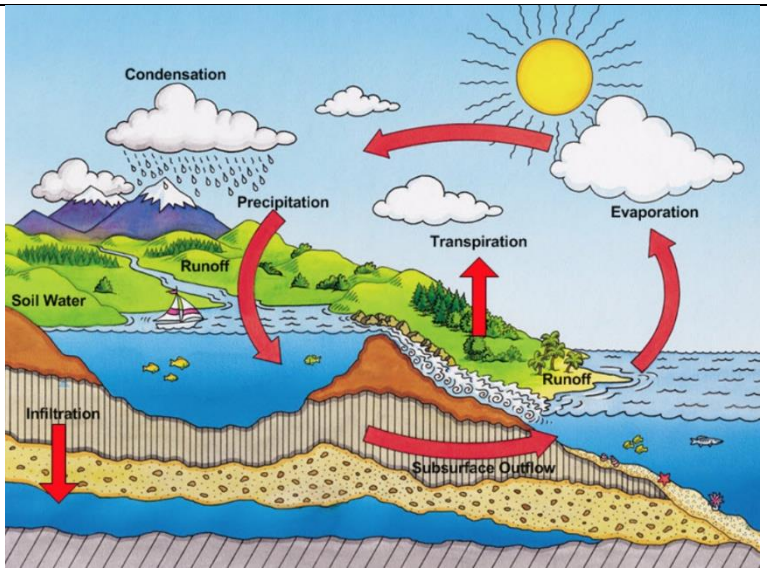
KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

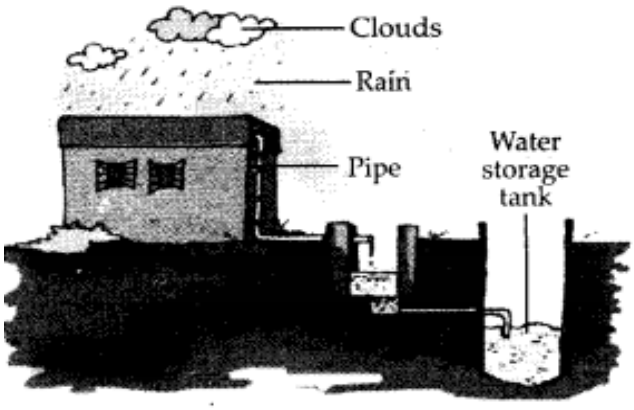
SESSION ENDING EXAM/ TERM END PAPER (2021-22)

CLASS – VI
SUBJECT – SCIENCE
SET-2

ANSWER KEY

S.NO	ANSWERS SET- 2	MARKS
	SECTION A	
1	(c)-Both the size and shape of the shadow of the tree change. OR (b)- Gaps between the leaves.	1
2	(d)- A thin wire. OR (b)- The chemical energy in electric cell may get used after working.	1
3	(b)- 5	1
4	(d)- Iron	1
5	(c) - Plate A will have less water than plate B.	1
6	(c)- Monsoon.	1
7	(d)- Oxygen	1
8	(a)- Dust particles may enter our lungs.	1
9	(d) All of the above	1
10	(c) - The garbage in pit A will rot while in pit B it will not rot. OR (a)- Plastic	1
	SECTION B	
11	(a)- A- Bulb, B- Electric cells	1
12	Transpiration	1
13	(a)- Recycle, Reduce, Reuse	1
14	(a)- Compost OR (b)- Biodegradable substances	1
	SECTION C	
15	Activity-Take a comb and fix it on one side of a cardboard sheet. Fix a mirror on the other side as shown in figure (fig no 11.9, NCERT Text Book, page no 112). Spread a dark coloured sheet of paper between the mirror and the comb. Send a beam of light from a torch through the comb. You get a pattern of light similar to that shown in figure. This activity explains the manner in which light travels and gets reflected from a mirror. (Activity 8, page 112, NCERT Text Book)	2
16	(i) N - N - Repulsion (ii) N - S - Attraction (iii) S - N - Attraction (iv) S - S - Repulsion	1/2X4=2

17		2
18-	With the help of a thread, the bar magnet is freely hung. The North pole of the magnet is its end that point North. OR A magnetic needle rotates freely in a compass. The magnetic needle aligns in a North – South orientation when a compass is kept at a specific location. The North pole is the red arrow on the compass and the South Pole is the opposite end which gives us the right direction.1	2
19	Major constituents of air- Nitrogen- 78%, Oxygen – 21%, Carbon dioxide – 0.03%, other gases OR Air is present in empty bottle.	2
20	Compost is better to use for crops because it is biodegradable substance and eco-friendly.	2
21	(i)- b, (ii)-c, (iii)- d, (iv)- a **SECTION - D**	2
22	 **OR** **DEFINITION-** Collecting rainwater and storing it for later use to increase the availability of water is called as rainwater harvesting.	2(diagram) +2(labelling) =4

	 **Fig.** : Rooftop rainwater harvesting	
23	(a)-Luminous objects- The objects which emits its own light are called as luminous objects. Example – Sun, Stars Non luminous objects- The objects which do not have its own light are called as non-luminous objects. Example- Table, chair. (b)- No, we cannot see the reflection in dark due to absence of light. OR A- Transparent objects- The objects through which we can see clearly are called as transparent objects. Example- Glass Translucent objects- The objects through which we can see but not clearly are called as translucent objects. Example – Oiled paper. Opaque objects- Th objects through which we cannot see are called as opaque objects. Example – Wooden door. B- YES	3+1=4
24	(a)- That object is a conductor as the bulb glows. (b)- The handles of the tools like screwdrivers and pliers used by electricians for repair work usually have plastic or rubber covers on them because rubber and plastic are insulators which do not allow electric current through them. OR (a)-The bulb would not glow if we use an eraser instead of safety pin in the given circuit as eraser is an insulator. (b)- A switch is a simple device that either breaks the circuit or completes it (c)- The current flows from positive terminal to negative terminal of the cell.	1+3 1+2+1=4
	VISUALLY IMPAIRED STUDENTS IN LIEU OF QUESTION-11,17,22,24	
11	Aluminium foil	1
17	Because electric energy changes into heat energy.	2
22	(a)- Condensation (b)- Evaporation (c) - Condensation (d)- Evaporation OR Two techniques of rainwater harvesting are as follows 1. Rooftop rainwater harvesting: In this system the rainwater is collected from the rooftop to a storage tank, through pipes. This water may contain soil from the roof and need filtering before it is used. Instead of collecting rainwater in the tank, the pipes can go directly into a pit in the ground. This then seeps into the soil to recharge or refill the ground water. 2. Allow water to go into the ground directly from the roadside drains that collect rainwater.	1X4=4 2 2

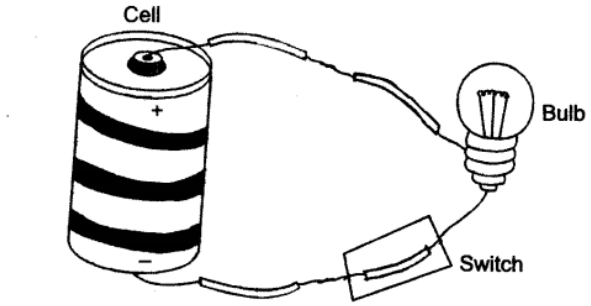
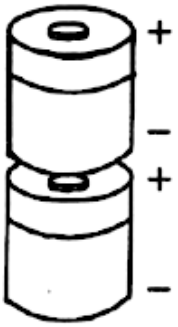
24	(a)- That object is a conductor as the bulb glows. (b)- The handles of the tools like screwdrivers and pliers used by electricians for repair work usually have plastic or rubber covers on them because rubber and plastic are insulators which do not allow electric current through them. OR (a) – Electric circuit (b)- Current flows from positive terminal to negative terminal of the cell. (c)- The switch breaks or completes the circuit.	1+3 1+1+2=4

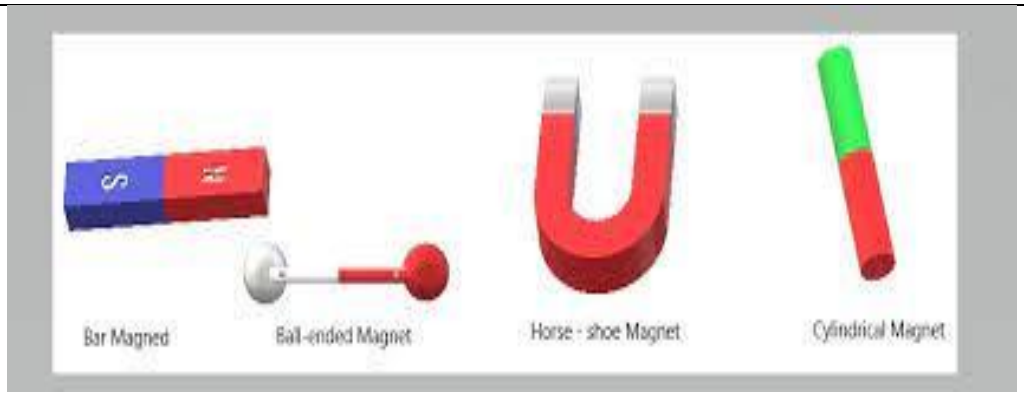
KENDRIYA VIDYALAYA SANGATHAN, DELHI REGION

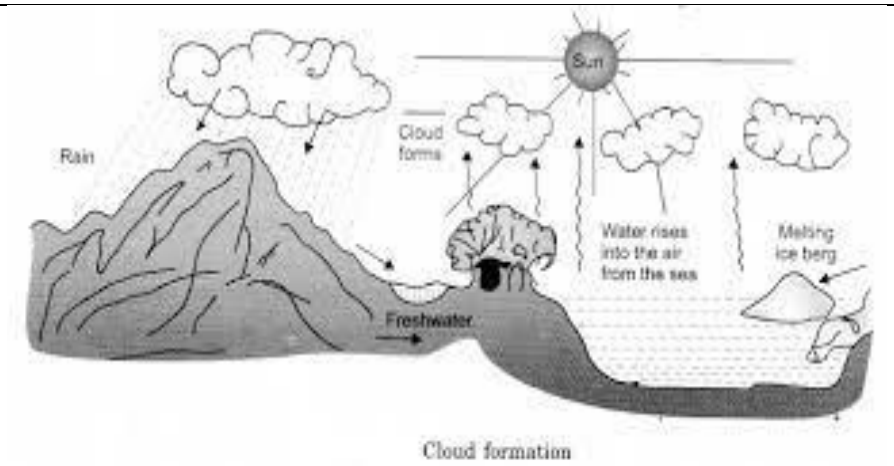
SESSION ENDING EXAM/ TERM END PAPER (2021-22)

CLASS – VI
SUBJECT – SCIENCE
SET-3

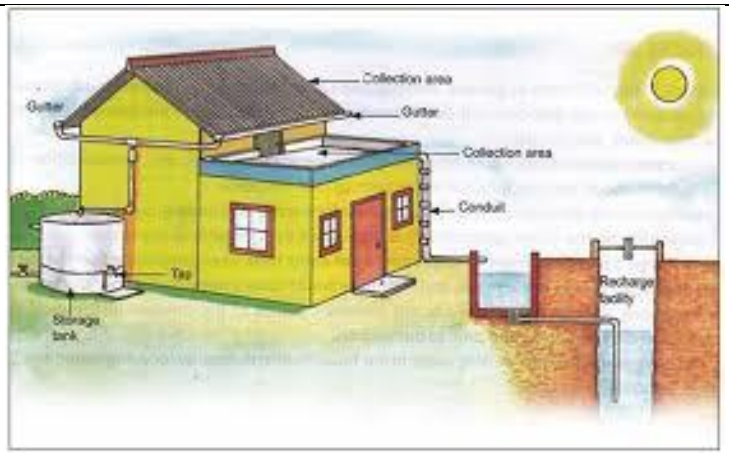
ANSWER KEY

S. NO.	ANSWERS	MARKS
1.	(d) D	1
2.	(b) Two	1
3.	(b) Fig. (b)	1
4.	(b) At the two ends of the magnet	1
5.	(d) Evaporates	1
6.	(c) Tube wells	1
7.	(d) It has no role in water cycle	1
8.	(b) The dissolved air in water	1
9.	(d) (ii), (iii) and (iv) only	1
10.	(a) Plastics	1
11.	Rubber, Wood/ Any other two correct answer	½+ ½
12.	Drought	1
13.	i) True ii) True	1
14.	The method of preparing compost with the help of red worms.	1
15.	 Fig. 12.14 **OR** 	1 + 1

<table>
<tr><td>16.</td><td> 
</td><td>2</td></tr>
<tr><td>17.</td><td>Air is the mixture of gases. Nitrogen (78%), Oxygen(21%), Carbon dioxide(0.03%), Water vapours, dust and other gases.</td><td>2</td></tr>
<tr><td>18.</td><td>No, we will not be able to see our image in the mirror as there is no source of light and no reflection of light.</td><td>2</td></tr>
<tr><td>19.</td><td>Magnetic materials- Iron, Cobalt, Nickel (any two)
Non- magnetic materials- Plastic, wood/ any other two correct</td><td>2</td></tr>
<tr><td>20.</td><td>(i) Respiration
(ii) Water cycle
(iii) Flying of birds
(iv) Rotation of windmill. / Any other correct activities
<u>OR</u>
Yes, it would help. Hot air makes evaporation faster and uniform will dry quickly.</td><td>2</td></tr>
<tr><td>21.</td><td>i) Vermicomposting
ii) Landfilling</td><td>2</td></tr>
<tr><td>22.</td><td>i) Current will flow from Q to P in Fig. A and P to Q in Fig. B
ii) Yes
iii) No</td><td>2
1
1</td></tr>
<tr><td>23.</td><td><table>
<tr><td>Transparent</td><td>Translucent</td><td>Opaque</td></tr>
<tr><td>Objects which allow the light to pass through them completely.</td><td>Objects which allow the light to pass through them partially.</td><td>Objects which do not allow to pass through them.</td></tr>
<tr><td>Eg. Glass, Water, Air</td><td>Eg. Butter paper, coloured glass</td><td>Eg. Book, Stone</td></tr>
</table>
ii) Fire fly / Jugnu</td><td>3

1</td></tr>
<tr><td>24.</td><td> 

Cloud formation
<u>OR</u></td><td>4</td></tr>
</table>

	 Rain water is collected from the rooftop to a storage tank through pipes. This water can be used for various purposes or it may be sent to the pits in the ground .	
	FOR VISUALLY IMPAIRED ONLY	
1.	(d) black	1
3.	(b) closed circuit	1
15.	Because rubber gloves act as insulator, it does not allow the electricity to pass to the body and prevent body from the current. **OR** Because the filament is broken and the circuit is not completed. Current does not flow in incomplete or open circuit.	2
16.	i) If they are dropped from a height or broken. ii) If they are exposed to heat.	2
22.	Electric switch is a device used to complete or break an electric circuit. Use- If switch is in ON position, the circuit gets completed and current flows through it. If switch is in OFF position, the circuit is incomplete or broken and current does not flow through it. Examples- T.V., Fan, Tube light/ Any other correct examples	1 2 1
24.	The constant movement of water from the Earth to the atmosphere and back to the Earth through the process of evaporation, condensation and precipitation is known as the water cycle. The water turns into vapours due to sun that go into air, rise up along and get cooler. At sufficient height, air becomes cooler and vapours get condense. Tiny droplets when accumulated, become heavier, come to the earth in the form of rain. **OR** Ways to conserve water- 1. Don't waste water 2. Repair leaking taps 3. Don't use drinking water in the garden or for cleaning 4. Don't throw any waste in water bodies. (Or Any other correct three) Activities- Washing clothes, Irrigation, Industrial use, Washing car/ Any other correct two .	4