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GURUGRAM REGION

STUDY MATERIAL FOR CLASS VIII

TERM II

(SESSION 2021-22)

CHAPTER 10 REACHING THE AGE OF ADOLESCENCE FOCUS
POINTS ADOLESCENCE

The period of life when the body undergoes changes leading to reproductive maturity is called adolescence. This is the time span in which the child develops into an adult.

- Adolescence begins around the age of 11 and goes on until 18-19 years of age.
- Adolescents are also called as 'teenagers.'

- The body at this age undergoes important changes and these marks period of puberty.

PUBERTY

Puberty is the period during which the human body undergoes certain changes and reproductive organs leads to sexual maturity.

- In girls, puberty may begin a year or two earlier than the boys.
- Several changes occur like increase in height, change in body shape, change in voice, development of sex organs, mental, intellectual and emotional maturity.

SECONDARY SEXUAL CHARACTERS

These are external visible characters that develops in boys and girls after puberty and help to distinguish the two sexes from each other. Following are some changes-

BOYS:

- The growth of facial hair, hair growth in underarms, abdomen, chest hair and pubic hair.
- Chest and shoulder widen and body becomes muscular.
- Secretion of sweat and sebaceous glands increases.
- Larynx (Adam's apple) protrudes out and voice becomes deep and husky.
- Sudden increase of height.

GIRLS:

- Enlargements of breasts.
- Growth of body hair prominently in the underarm and pubic areas.
- Widening of hips.
- Development of reproductive organs.
- Menstruation starts.
- Voice becomes high pitched.

HORMONES

Hormones are chemical messengers secreted by the endocrine glands. They control & coordinate body functioning, physiology and behavior.

PITUITARY GLAND

This is the master gland located in the brain and it releases **growth hormone** which helps in the growth of the person during adolescence period.

TESTOSTERONE

This is the primary **male sex hormone**.

It is responsible for the development of male reproductive organs, production of male gamete **sperms** and development of secondary sexual characters in males.

ESTROGEN

This is the primary **female sex hormone**.

It is responsible for development of female reproductive organs, production of female gamete **ova** and development of female secondary sexual characters.

THYROID GLAND

This gland is situated in the throat.

It secretes a hormone called **thyroxin**.

This hormone is important as it maintains the balance of all metabolic activities. The deficiency of this hormone can cause swelling of the thyroid gland leading to **goiter**.

PANCREAS

This gland secretes a hormone called as **insulin** which regulates the sugar level in the body.

Deficiency of this hormone leads to **diabetes**.

ADRENAL GLAND

These glands are situated above the kidneys.

They secrete a hormone called as **adrenaline** which is also called as fight hormone and regulates heart rate at emergency situations.

MENSTRUAL CYCLE

- It is a reproductive cycle of females.
- It begins at puberty and the onset of menstrual cycle is called as **menarche**.
- In this cycle, changes in the ovaries and in the uterus takes place controlled by female sex hormone **estrogen**.
- In the ovaries, an ovum matures and gets released every month.
- In the uterus a thick spongy inner lining develops.
- If the egg gets fertilized, then pregnancy occurs but if fertilization does not take place the released egg along with the thickened uterus lining breaks down and sheds off from the female vagina in the form of bleeding which is also called as **periods**.
- The menstrual cycle stops at the age of 45-50 years of age. Stopping of menstrual cycle is termed as **menopause**.

SEX DETERMINATION

- All human beings have 23 pairs of chromosomes in the nuclei of the cells.
- Two chromosomes out of these are called as sex chromosomes named as X and Y.
- A female has two X chromosomes while a male has one X and one Y chromosome.
- If the X chromosome of male fuses with the x chromosome of female, then the baby will be a girl, while if the Y chromosome of male fuses with the X chromosome of female, then the baby will be a boy.

REPRODUCTIVE HEALTH

Personal hygiene

Personal hygiene is very important during teenage period. Increased activity of sweat glands will make the body smelly. So one should take regular bath and keep the body clean and hygienic.

Balanced Diet

Adolescence requires growth of the body. Therefore, all the teenagers should consume a balanced diet which includes proteins, carbohydrates, fats and vitamins in proper proportions. Junk food should be avoided.

Physical exercise

Exercise should be important at this age. Walking, playing and doing yoga should be done.

SAY “NO” TO DRUGS

- Drugs are addictive and harm the body in long term.
- All teenagers should say “NO” to any kind of drugs.
- HIV is a type of virus which causes AIDS.
- HIV can pass on to a normal person from and infected person by sharing syringes used for injecting drugs.
- It can also be transmitted to an infant from HIV positive mother through breastfeeding.
- The virus can also be transmitted through sexual contacts with the person infected with HIV.

Reaching the age of adolescence: - ➤ Multiple choice questions: -

1) Which of the following combinations of chromosome leads to the birth of a female progeny (baby/child) in humans?

A) XX B) XY C) X D) Y

2) The organisms which have both the male and female sex-organs present in the same individual is called a _____?

A) multi-sexual B) unisexual C) hermaphrodite D) none of these

3) The first menstrual flow that begins at puberty in females is called _____.

A) menopause B) menarche C) puberty D) pregnancy 4)

The master gland in the body is _____.

A) Thyroid B) adrenal C) pituitary D) testes

5) The menstruation cycle in girls usually lasts for about _____.

A) 5 to 7 days B) 10 to 14 days C) 28-30 days D) all above 6)

The voice box is also called as _____.

A) Pharynx B) larynx C) windpipe D) esophagus

7) Which of the following is not an exocrine gland _____?

A) pituitary gland B) mammary gland C) sebaceous gland D) salivary gland 8)

Insufficient production of insulin in the body causes _____.

A) Addison's disease B) cretinism C) diabetes D) none of these

9) Hormones are transmitted to the place of target through _____.

A) nerves B) blood C) ducts D) all above

10) The sex of a child is determined by the _____.

A) Mother's chromosomes B) father's chromosomes

C) RH factor of the father D) none of these

11) The chemical substances which are secreted from endocrine glands are called _____.

A) puberty B) hormones C) estrogen D) adolescence 12)

Production of thyroxin requires _____.

A) sodium (Na) B) potassium (k) C) magnesium (Mg) D) iodine (I)

13) AIDS can spread from an infected person to another person through _____.

A) sharing food B) blood transfusion C) sharing comb D) mosquito bite

14) The structure present in a cell which is responsible for determination of the sex of a baby is _____.

A) Cytoplasm B) nucleus C) chromosome D) mitochondria

15) Reproductive age in women starts during their initiation of _____.

A) Menstruation B) breast development C)

Body weight increases D) height increases

> Short answer type questions:

1) What are initial changes in human body at puberty?

2) What are the changes seen in girls at the time of puberty?

- 3) Why do some adolescents feel insecure?
- 4) Explain reproductive health.
- 5) Explain the change in body shape of boys and girls.
- 6) How will you calculate the approximate height at the end of growth period of a boy of 9 years 120 cm in height?
- 7) Briefly explain the function of pituitary gland.
- 8) Why one should get married only after a certain age?
- 9) List changes in the body that takes place at puberty.
- 10) What is balanced diet?
- 11) Distinguish between menarche and menopause.
- 12) Write some myths about hormones, which are not facts in science?
- 13) Why pituitary gland is called master gland?
- 14) What are sex hormones? State their functions.

➤ Very short answer type questions:

- 1) What is the age of adolescence in humans?
- 2) Name the female hormone?
- 3) What is the name of female sex-chromosome?
- 4) Which organ is called voice box?
- 5) Why an individual can reproduce only after a certain age?
- 6) Which is the most important change that marks puberty?
- 7) What is the target site of hormone?
- 8) Name the endocrine gland attached to the brain.
- 9) What are hormones?
- 10) Do the boys and girls undergo same physical changes during adolescence?
- 11) At what age does the growth in human body become noticeable?

12) How many pairs of chromosomes are found in nucleus of cells of human beings?

13) What are the sex-chromosomes found in human males?

14) Is mother responsible for the sex-determination of the baby in humans?

15) Give the name of disease which is caused by the lack of thyroxin hormone?

16) Which type of food consumption is good and healthy for adolescents?

A. Long answer type questions: -

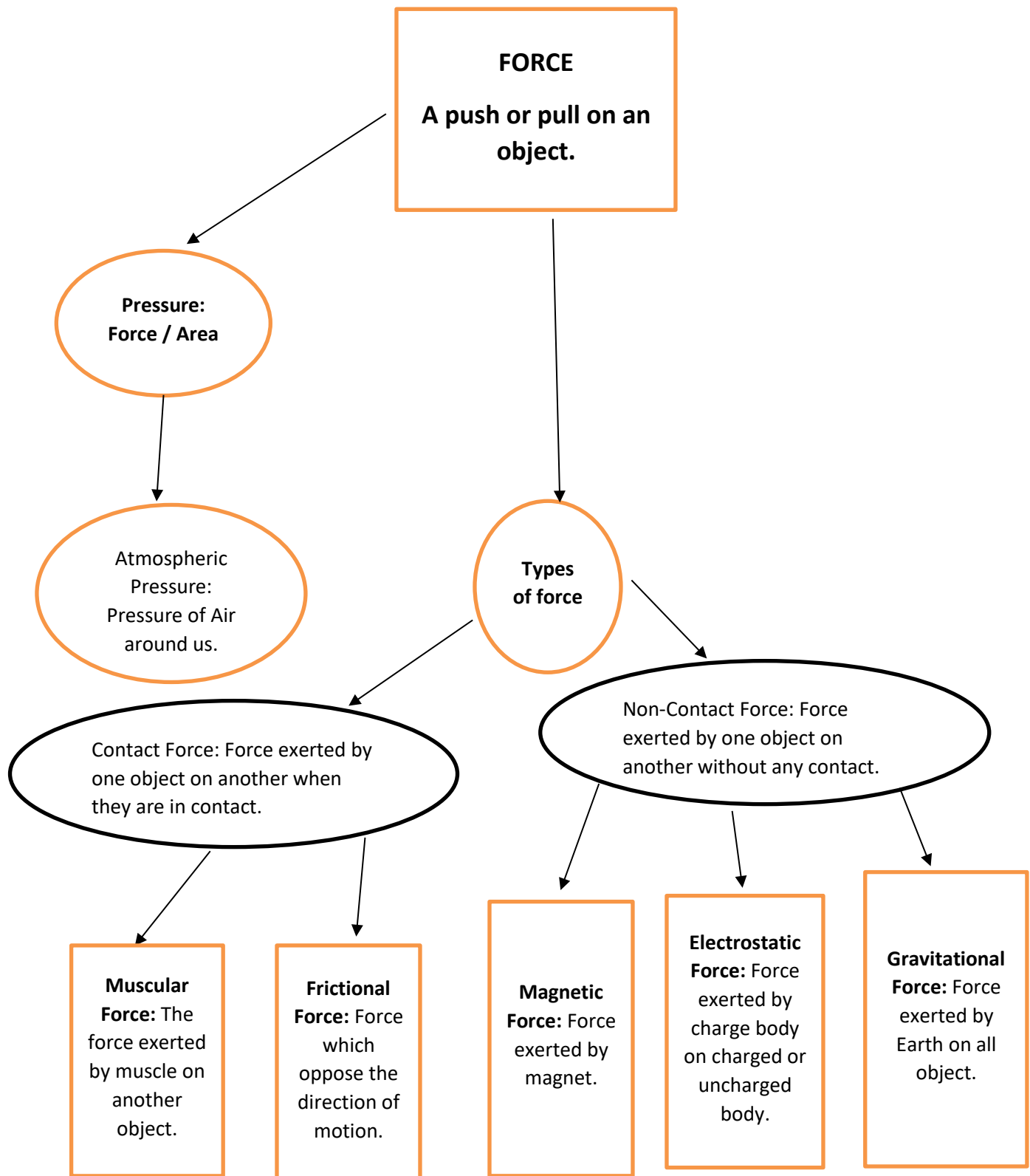
- Prepare a table having two columns depicting names of endocrine glands and various hormones that are secreted by them.
- With the help of a diagram show, how is sex determined in the unborn baby?
- Show the endocrine glands in the human body with a suitable diagram.

- What are the different effects of sex-hormones on human body?

➤ Competency based questions: -

- 1) Lilly always eats only dal and rice regularly and often falls ill and has become prone to diseases. Can you suggest changes in a diet which can make her healthy and free from diseases?
- 2) Our government has legalized the age for marriage in boys and girls. Give justifying reasons as to why one should get married after a certain age?
- 3) Why adrenaline hormone is also called emergency hormone?
- 4) Manish and Manisha were classmates since their childhood. When Manisha became 11 years old, she developed swelling on her neck for which she visited to a doctor who started medication for her after a few years. Manish also developed a slight protrusion on his throat for which he went to a doctor, but the doctor assured him that it was a normal and natural in boys while they are growing. Can you think of any reasons for the difference in diagnosis?

Mind Map: CH 11 (Force & Pressure)



Chapter-11: Force and Pressure

Force: Force is the push or pull on an object. E.g.- If an object has to be moved, it has to be pushed or pulled.

Forces are due to interaction: An interaction of one object on another object results in a force between the two objects. E.g.- If a man stands behind a car, the car does not move. If he pushes the car, he applies force and the car begins to move in the direction of the applied force.

Exploring forces:

- If two forces act on a body in the same direction, the net force is the sum of the two forces.
- If two forces act on a body in opposite directions, the net force is the difference between the two forces.
- The effect on the object depends on the net force acting on it. Effects of force on an object:
 - Force can make an object to move from rest.
 - Force can stop a moving object.
 - Force can change the speed of an object if it is moving.
 - Force can change the direction of a motion of an object.
 - Force can change the shape of an object.

Force may cause one or more of these effects.

Types of forces: There are two main types of forces as Contact and Non-contact forces.

Contact forces are forces exerted by one object on another when they are in contact with each other.

- Contact forces are of two types. They are Muscular force and Force of friction.

Non-contact forces are forces exerted by one object on another without any contact with each other.

- Non-contact forces are of three types. They are Magnetic force, Electrostatic force and Gravitational force.

Contact forces:

Muscular force: Muscular force is the force exerted by the muscles of our body. • We use muscular force for our various activities. Animals like bullocks, horses, camels, donkeys, elephants also use muscular force to perform various tasks.

Force of friction: Force of friction is the force which opposes the motion of an object over a surface. E.g.- A ball rolling on ground gradually slows down and comes to rest due to force of friction. If we stop pedaling a bicycle, it gradually slows down and comes to a stop due to force of friction.

Non-contact forces:

Magnetic force: Magnetic force is the force exerted by magnets. E.g.- Force of attraction and repulsion between two magnets. Force exerted by a magnet on a piece of iron or steel.

Electrostatic force: Electrostatic force is the force exerted by a charged body on another charged or uncharged body. E.g.- A plastic straw charged by rubbing with paper attracts a suspended plastic straw. A plastic straw charged by rubbing with paper repels a suspended plastic charged by rubbing with paper.

Gravitational force: Gravitational force is the force exerted by the earth on all objects. It pulls all objects towards the earth. E.g.- A coin or pen falls down when it slips off from our hand. A ball thrown upward falls down. Leaves and fruits fall to the ground when they get detached from the plant. Water in rivers flow downwards.

Pressure: Pressure is the force acting on unit area of a surface.

$$\text{Pressure} = \text{Force} / \text{Area}$$

If the area is smaller, the pressure is more on the surface for the same force. E.g.- It is easier to push a nail into a wooden plank by its pointed end than its head because the pressure is more. It is easier to cut vegetables with a sharp knife than a blunt knife because the pressure is more. Shoulder bags have broad and not thin straps to reduce pressure.

Pressure exerted by liquids:

- Liquids exert pressure on the walls of a container.
- Liquids exert pressure on the bottom of a container. It depends upon the height of the liquid column.
- Liquids exert sideways pressure.
- Liquids exert equal pressure at the same height.

Pressure exerted by gases: Gases exert pressure on the walls of a container.

Atmospheric pressure:

- Atmospheric pressure is the pressure of air around us.
- Atmospheric pressure is due to the weight of air.

Important questions VSA

1. Give two examples of contact force.
2. Name the force exerted on a ball of dough to make a flat chapatti.
3. Define force? Write its unit.
4. Give one example of gravitational force.
5. What is meant by atmospheric pressure?

SA (Short Answer questions)

6. What are the effects of force on an object?
7. Define the different types of forces.
8. Difference between contact and non-contact force.
9. Define frictional force? How it arises?
10. What are the examples of muscular force?
11. Give two examples of a situation in which applied force causes a change in the shape of an object.

LA (long answer questions)

12. What is pressure? a. What is the relation of pressure with area on which it is applied? b. How can we increase the pressure by exerting same force?

CHAPTER 12 FRICTION

FOCUS POINTS:

Friction is commonly called as 'Necessary Evil' because without frictional force even simplest tasks of our life like sliding and sliding or writing or moving and dancing aren't possible.

Key points are there in this chapter which can be kept in mind.

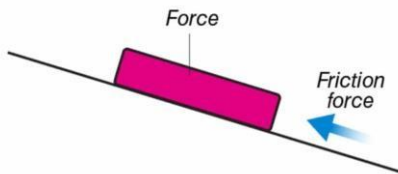
- Friction: A force that opposes motion between two objects that are in contact with each other. Smoother surfaces exhibit less friction, rougher surfaces exhibit more friction.
- Friction opposes the relative motion between two surfaces in contact. It acts on both the surfaces.

- Friction depends on the nature of surfaces in contact.

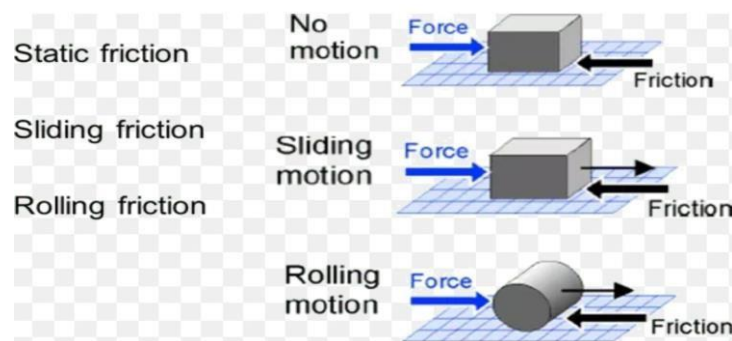
- Types of Friction:

- (i) Static Friction: When a body is at rest, the force of friction is called the static friction and is always equal and opposite to the applied force. The force of friction which acts when the body is just at the verge of sliding on the surface is called limiting friction.

- (ii) Sliding friction: The friction force which opposes the actual relative sliding motion between two contact surfaces. Sliding friction is smaller than static friction.



- (iii) Rolling Friction: The frictional force that exists between two surfaces when a body rolls over the other. Rolling friction is smaller than sliding friction.



- Increasing Friction: By pressing the surfaces together more strongly. When brakes are applied on a bicycle or car, the brake pads press against a moving part of the wheel and the force of friction increases.

- Reducing Friction: Polishing, Lubricating, using ball bearings, separation of surfaces by air, streamlined shape.

- Causes of friction: Friction is caused by the irregularities on the two surfaces in contact.

Even those surfaces which appear very smooth have a large number of minute irregularities on them.

- For a given pair of surfaces friction depends upon the state of smoothness of those surfaces.
- Friction depends on how hard the two surfaces press together.
- Static friction comes into play when we try to move an object at rest. • Sliding friction comes with play when an object is sliding over another.

Sample Questions for practice.

MCQs

1. Pushing a box at rest is an example of...
 - a. Weight
 - b. Mass
 - c. Inertia
 - d. Static friction
2. Friction is a type of
 - a. Nuclear force
 - b. Gravitational force
 - c. Contact Force
 - d. Electromagnetic force
3. Rolling friction and sliding friction are related as (select the correct statement)
 - a. Rolling friction is always less than sliding friction
 - b. Rolling friction is greater than sliding friction
 - c. Rolling friction is equal to sliding friction
 - d. None of the above

VSA

1. What is Friction?
2. How friction can be reduced suggested any two ways.
3. Define static friction.
4. State two factors on which force of friction depends.
5. How increased friction between two surfaces be beneficial?

SA

1. Draw a simple diagram to show sliding friction for a box sliding down on an inclined plane.
2. Suggest any three ways by which friction can be reduced.
3. Explain in detail why friction is considered as necessary evil.

CHAPTER 13 SOUND

Sound: Sound plays an important part in our daily lives. It helps us to communicate with each other. We hear a wide variety of sounds in our surroundings. Sound is produced by a vibrating body. Vibration is the ‘to and fro’ or ‘back and forth’ motion of an object. e.g.- If you strike a school bell, it vibrates and produces sound.

- If you pluck a stretched rubber band, it vibrates and produces sound.
- If you beat a drum, its stretched membrane vibrates and produces sound.
- If you blow a bugle, the air column vibrates and produces sound.

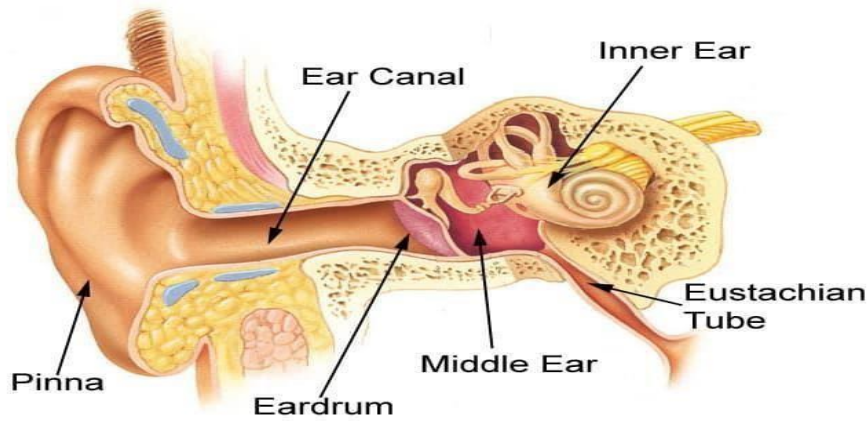
Musical instruments and their vibrating parts: Some musical instruments produce sound when they are beaten or struck. E.g.- Bell, Ghatam, Manjira, Jaltarang etc.

S. No.	Musical instrument	Vibrating part producing sound
1.	Veena	Stretched string
2.	Sitar	Stretched string
3.	Violin	Stretched string
4.	Tabla	Stretched membrane
5.	Mridangam	Stretched membrane
6.	Shehnai	Air column
7.	Flute	Air column
8.	Mouth organ	Air column

Sound produced by humans: In humans sound is produced by the voice box or larynx. It is the upper part of the wind pipe. Two vocal cords are stretched across the voice box leaving a narrow slit. When the lungs force air through the slit, it vibrates and produces sound.

Sound requires a medium to propagate: Sound travels through solids, liquids and gases. Sound does not travel in vacuum. E.g. - Sound travels through the solid thread of a toy telephone. A whale listens to the reflected sound (echo) in water to locate its prey. We are able to listen to sounds because sound travels in air (a mixture of gases).

How we hear sound through our ears? Sound enters the ear through the ear canal. It makes the eardrum to vibrate. The ear drum sends the vibrations to the inner ear. From there the signals go to the brain and then we hear the sound.



Amplitude, Time period and Frequency of Vibration:

Vibration is the 'to and fro' motion of an object. It is also called oscillatory motion.

- The maximum displacement of an oscillating body from its central position is called its amplitude. The motion of the pendulum from one extreme position to the other extreme position and back to initial position is called an oscillation.

The time taken for one oscillation is called time period.

- The number of oscillations per second is called frequency. The unit of frequency is hertz (Hz).

Loudness of sound: The loudness of sound depends upon the amplitude of vibration. If the amplitude is less, the sound is feeble. If the amplitude is more, the sound is loud. The unit of loudness is called decibel (dB).

Pitch of sound: The pitch of sound depends upon the frequency of vibration.

- If the frequency is less, the sound has low pitch. E.g.- sound of a drum, sound of an adult.
- If the frequency is more, the sound has a high pitch. E.g.- sound of a whistle, sound of a baby etc.

Audible and inaudible sound:

Audible sound is sound which we can hear. It has frequencies between 20 Hz and 20000 Hz. (Between 20 and 20000 vibrations per second). Inaudible sound is sound which we cannot hear. It has frequencies less than 20Hz and more than 20000 Hz. (Less than 20 vibrations per second and more than 20000 vibrations per second). Sound whose frequencies are more than 20000 Hz is called ultrasonic sound. Some animals like dogs can hear ultrasonic sound. Bats produce ultrasonic sound.

Noise and Musical sound: Unpleasant sounds are called noise. It is produced by irregular vibrations. E.g.- If all the students in a classroom speak together, a noise is

produced. Sounds produced by horns of buses and trucks. Sound which is pleasing to the ears is called musical sound. It is produced by regular vibrations. E.g.- Sounds produced by musical instruments. Sound of a person singing a song.

Noise pollution: The presence of excessive or unwanted sound in the environment is called noise pollution.

Causes of noise pollution: Noise pollution is caused by sounds of vehicles, explosions including bursting of crackers, machines, loudspeakers etc. In the home noise pollution is caused by television, radio and music systems at high volume, some kitchen appliances, desert coolers, air conditioners etc.

Harmful effects of noise pollution:

Noise pollution causes several health-related problems like lack of sleep, hypertension, high blood pressure, anxiety etc. A person exposed to loud sound continuously may get temporary or permanent impairment of hearing.

Measures to limit noise pollution:

Noise pollution can be reduced by using silencers in vehicles, industrial machines. Home appliances reducing use of vehicle horns, running TV, radio and music systems at low volumes. Planting of trees along roadside and buildings also help to reduce noise pollution.

Hearing impairment

Hearing impairment is also called Hearing loss. It makes it hard to hear or understand the sounds. This happens when there is a problem with one or more parts of the ear, the nerves coming from the ears, or the hearing part of the brain. It is rare and is usually from birth itself. Partial disability is generally the result of a disease, injury or age. the people suffering from hearing impairment can learn with the help of sign language and technological device. **Very short answer questions: -**

Q1. What are the vibrating parts of flute?

Q2. What is the unit of frequency?

Q3. What is the audible range of Human ear?

Short answer questions: -

Q1. How is sound produced and how is it transmitted and heard by us.

Q2. Classify the following into music and noise. Radio at high volume, desert cooler, harmonium sound, string of sitar.

Q3. Suggest any two measures to limit noise pollution in your locality.

Q4. What is Adam's apple?

Long answer questions: -

Q1. State the differences between ultrasonic sound and infrasonic sound.

Q2. What are the methods to control noise pollution?

Q3. Differentiate between musical sound and noise.

Q4. Draw the diagram of internal ear and also explain its structure.

CCT based questions

Human ear is designed in such a way that it can hear the sounds up to a certain frequency. The sound waves travelling through the ear are later carried to brain as electrical impulses to understand the type of sound. Sounds beyond certain frequencies can cause permanent damage to our ears. Sound below certain frequencies cannot be heard by.

1) The maximum range of human hearing lies between

A. 20 Hz to 20 KHz

B. 20 Hz to 200 KHz

C. 20 Hz to 20000 KHz

D. 200 Hz to 20000 Hz

2) What do you call the sounds that fall below 20 Hz and above 20 KHz?

3) Which one of the following is correct with reference to transmission of sound waves to brain?

A. Sound waves are transmitted as neutral impulses

B. Sound waves are transmitted as chemical impulses

C. Sound waves are transmitted as electrical impulses

D. None of them

4) Can any perforation (hole) in our ear drum affect the hearing ability?

5) The speed of sound in air is dependent of change in-

- A. Temperature
- B. Humidity
- C. Wind speed
- D. All of the above

Multiple choice questions: - Q1. The pitch of the sound depends on

- A. Frequency
- B. Amplitude
- C. None of these
- D. Both of these

Q2. Sound propagates maximum in

- A. Gas
- B. Liquid
- C. Solid
- D. All

Q3. What is the speed of sound in air?

- A. 110 meters per second
- B. 220 meters per second
- C. 330 meters per second
- D. 440 meters per second

Q4. Which of the following produces noise only?

- A. Jet engine
- B. harmonium
- C. Flute
- D. Guitar

Q5. Frequency of sound is lowest for

- A. Man
- B. Woman
- C. young boy
- D. Young girl

Q6. Which one of the following materials will reflect sound better?

- A. Thermocole
- B. Curtain made from cloth
- C. Steel
- D. Paper

Q7. Vocal cords are the part of

- A. Mouth
- B. Ear
- C. Eyes
- D. Larynx

Q8. The speed of sound in solid, liquid and gas can be correctly compared as

- A. solid >liquid>gas
- B. Liquid >gas>solid
- C. Liquid >solid >gas
- D. Gas> liquid>gas

Q9. An object moving at a speed greater than that of sound is said to be moving at

- A. Ultrasonic speed
- B. Sonic speed
- C. Infrasonic speed
- D. Supersonic speed

Q10. The velocity of sound in a vacuum is

- A. 332 meters per second
- B. 330 meters per second
- C. 288 meters per second
- D. 0

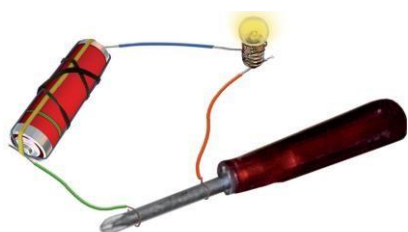
CHAPTER-14

CHEMICAL EFFECTS OF ELECTRIC CURRENT

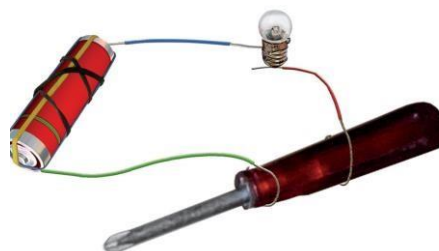
FOCUS POINTS:

Good and Poor Conductors of Electricity [Conductors and insulators]

- Materials or substances that allow electric current to flow through them easily are called good Conductors of electricity.
- Materials or substances that do not allow electric current to flow through them easily are called Poor Conductors of electricity.



GOOD CONDUCTOR



POOR CONDUCTOR

- An insulator is any substance or material that prevents the flow of electricity through it.
- Any substance can be called as a conductor of electricity if it allows movement of charges through it.
- The electrons of the conductors can flow freely (they are delocalized) and hence can take electric current through them.

- Insulators do not allow the flow of charges through them because their electrons are tightly packed with their particles.
- Every material may conduct electricity in certain situations. For example, air is a bad conductor of electricity but in case of thunderstorms and lightning it carries electric charges through it. Hence, materials are always classified as good and poor conductors of electricity rather than conductors and insulators.

Can liquids conduct electricity?

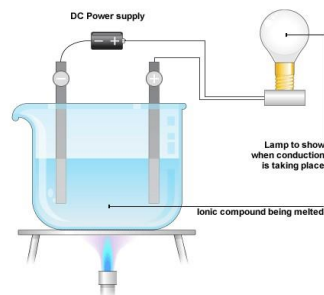
- Not all liquids can conduct electricity. However, some of them can be regarded as good conductors of electricity while others as poor conductors of electricity.
- Water containing salts and minerals dissolved in it always conduct electricity.
- Distilled water which does not contain any salts cannot conduct electricity.
- Any solution of acids or bases can also conduct electricity.

Material under test	Good conductor/Poor conductor
Distilled water	Poor conductor
Tap water	Good conductor
Lemon juice	Good conductor
Vinegar	Poor conductor
Cooking Oils	Good conductor
Milk	Good conductor
Honey	Poor conductor
Soda compounds	Good conductor
Mercury	Good conductor
Fuels	Poor conductor

How do liquids conduct electricity?

- Different substances when mixed in water and electricity is passed through them can break apart and form positive and negative particles or ions in the water.
- These ions can pass the electric current through them.
- The more is the number of ions in a liquid the better conductor it is of electricity.
- That is why distilled water is a poor conductor of electricity but salt water is a good conductor of electricity.

- However, many compounds do not form any ions on mixing them with water and therefore they are poor conductors of electricity such as sugar water, oil and alcohol.



Why LED bulbs are more suitable for testing the electrical conductivity of liquids?

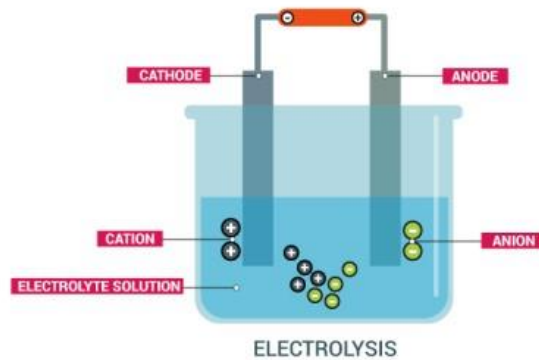
- The electric current often causes heating effect due to which the filament of the bulb gets heated up and glows.
- However, some liquids are capable of conducting electricity but they are **weak conductors** of electricity. Hence current passes through them but it is not that strong enough to heat up the filament. As a result, the filament would not light up in the case of such liquids.
- However, the LED bulbs can detect the flow of even a small amount of electric current as well. Hence, LED bulbs are suitable for testing the electrical conductivity of liquids



- Longer led wire is always connected to positive and the smaller wire is to negative terminal.
- **The weak current flowing through liquids can be detected by using a compass.**

What is electrolysis?

The effect in which components of a compound get split due to passing an electric current through it is called electrolysis.



What is an electrode?

An electrode is a conductor of electricity that can carry electric current into nonmetals and other poor conductors of electricity.

What is an electrolyte?

A solution that breaks into its ions on passing electricity through it is called an electrolyte. Electrolytes are used in the process of electroplating.

What are an anode and cathode?

The positively charged electrode is called anode and the negatively charged electrode is called cathode.

What are anions and cations?

An anion is a negatively charged ion and a cation is a positively charged ion.

Effects of an electric current

- **Heating effect:** electric current causes heating of the electrical equipment. For example, the filament of a bulb gets heated up due to electric current and therefore glows.
- **Magnetic effect:** electric current can give rise to the magnetic field of a substance.
- **Chemical effect:** electric current can lead to the production of chemical energy or chemical reactions.

Chemical effects of electric current

We know that when an electric current passes through solution it ionizes and breaks down into ions. This is because of **chemical reactions** that take place when an electric current passes through a solution. Depending on the nature of the solution and the electrodes used, the following effects can be observed in the solution:

1. metallic deposits on the electrodes
2. change in the colour of the solution

3. a release of gas or production of bubbles in the solution (Electrolysis of acidified water by using carbon electrodes, then a chemical reaction takes place to form hydrogen gas and oxygen gas)

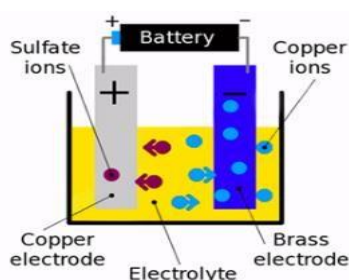
Applications of chemical effects of electric current

Electroplating

- Electroplating is a process in which layer of metal is deposited on another material with the help of electricity.
- Electroplating is used in many industries for depositing a layer of metal with desired characteristics on another metal.
- Different metals used for electroplating are Nickel, Copper, Gold Silver, Tin, Brass, Zinc, Chromium and Platinum.

Process of electroplating

- In order to conduct electroplating right electrodes and electrolytes must be chosen so that metal can deposit over a material.
- For instance, if we want to deposit copper on a material, we need an electrolyte that contains copper in it. Similarly, if we need gold on a material, we need an electrolyte that contains gold in it.
- Also, we should make sure that the electrode that we are choosing is completely clean.
- The electrodes used are made up of different materials. One of the electrodes is of the same metal of which the electrolyte solution is. The second electrode needs to be the material on which we want to coat another metal.
- For instance, in case we want to plate copper upon brass, one electrode should be of copper and the other electrode should be of Brass and the electrolyte solution should be any salt which contains copper in it, for example, copper sulphate solution. Consider the diagram given below that describes the process of electroplating of copper.



- Out of these two electrodes the copper electrode acts as the anode (positive electrode) and brass electrode acts as the cathode (negative electrode).

- When electricity is passed through the solution, the copper sulphate breaks down into its ions.
- The copper ions (they have a positive charge) get attracted by the brass electrode while the sulphur ions being negatively charged move towards the copper electrode.
- As a result, copper starts depositing on the brass electrode.
- The process of electroplating takes some time to complete.
- The amount of time that it will take depends upon the strength of the current that is being passed through the circuit and also upon the concentration of the electrolyte.
- As these two are increased the speed of the electroplating process also increases.

Applications of electroplating

- Medical equipment is made up of nickel which is harmful to the human body hence to avoid it from coming in contact with our body a coating of platinum or gold is applied on the surface of nickel.
- Many kitchen equipments, bath taps, parts of cars etc. are covered with chromium coating. Chromium is an expensive metal hence the objects are created with the cheaper metal and chromium coating is provided. Thus, to bring a shining over the objects and prevent them from corrosion chromium coating is used.
- Jewellery makers often make ornaments of less expensive metals and provide a coating of gold or silver upon them.
- The tin cans that are used to store food are actually made up of iron and have a coating of tin on them. Iron can easily react with food and spoil it, however, tin prevents the food from getting reacted with iron and therefore helps in preventing it from getting spoiled easily.
- Bridges and various parts of automobiles are made up of iron because it provides strength. However, in order to prevent iron from getting rusted a coating of zinc is provided over it. This method is also called galvanization of iron.

ACTIVITY 1

Students will be asked to find out the good and poor conductors of electricity by doing simple experiment.

Material supplied: led bulbs, battery cell, copper wire, aluminium wire, iron wire, zinc metal piece, magnesium ribbon, graphite rods, pencil, plastic spoon, wax candle, cotton thread, and rubber elastic.

Methodology: Children will connect all the materials in a circuit and observe whether the bulb glows or not. If the bulb glows, the material connected in the close circuit is a good conductor of electricity.

Skills involved are; forming a close circuit, arrangement of items, application, observation, analysis and evaluation.

Evaluation:

1. When and why does the bulb glow?

2. When and why does not the bulb glow?

Outcomes: Children will understand the concept behind the good conductors and poor conductors and will be able to know and identify the materials as good and poor conductors, which they come across in their day today life.

ACTIVITY-2

Objective-

To purify impure copper metal.

Procedure-

1. Take 250 ml of distilled water in a clean beaker.
2. Dissolve 2 teaspoon full of copper sulphate in it.
3. Add a few drops of dilute sulphuric acid to copper sulphate solution.
4. A thick rod of impure copper metal is made positive electrode by connecting it to the positive terminal of the battery.
5. A thin plate of pure copper metal is made negative electrode by connecting it to the negative terminal of the battery.
6. Switch on the electric current by closing the switch.
7. Allowed the current to pass for about half an hour .

Observation-

It will be observed that the impure copper rod goes on becoming thinner and thinner whereas the pure copper plate goes on becoming thicker and thicker. This is because the impure copper metal of anode goes on dissolving in copper sulphate solution whereas the pure metal from copper sulphate solution goes on depositing on copper plate cathode. Impurities present in impure rod of copper falls to the bottom of the beaker.

Result -

The copper metal of impure copper rod(anode) gets deposited on the pure copper plate (cathode).

Questions -

1. Why do copper ions move towards cathode?
2. Why do impurities not move towards cathode or anode?

QUESTION BANK

Choose the correct option.

Question 1.

Which of the following is a bad conductor of electricity?

- (a) Distilled water
- (b) Silver nitrate
- (c) Sulphuric acid (d) Copper sulphate

Question 2.

Which of the following does not conduct electricity?

- (a) Sugar solution
- (b) Vinegar solution
- (c) Lemon juice solution (d) Caustic soda solution

Question 3.

An electric current can produce

- (a) heating effect
- (b) chemical effect
- (c) magnetic effect (d) all of these

Question 4.

Pure or distilled water is a

- (a) poor conductor
- (b) good conductor
- (c) both (a) and (b) (d) none of these

Question 5.

Which of the following is a good conductor?

- (a) Brick
- (b) Steel

(c) Plastic (d) Cotton

Question 6.

Polythene is

- (a) a conductor
- (b) an insulator
- (c) both (a) and (b) (d) none of these

Question 7.

Electroplating is based on

- (a) heating effect of electricity
- (b) chemical effect of electricity
- (c) physical effect of electricity (d) magnetic effect of electricity

Question 8.

Copper is

- (a) a good conductor
- (b) an insulator
- (c) both (a) and (b) (d) none of these

Question 9.

Waste from an electroplating factory must be disposed off

- (a) in the nearby river
- (b) in the nearby pond
- (c) in the nearby cornfield
- (d) according to the disposal guidelines of Waste Management Bodies

Question 10.

An electrolyte is

- (a) a metal
- (b) a liquid that conducts current
- (c) a non-metal (d) none of these

Question 11.

Flow of electron is called

- (a) electrolyte
- (b) electroplating
- (c) electrodes
- (d) electric current

Question 12.

Which of the following is not used for electroplating metal articles?

- (a) Nickel
- (b) Silver
- (c) Chromium (d) Sodium

Question 13.

An electric lamp glows due to

- (a) heating effect
- (b) magnetic effect
- (c) chemical effect (d) physical effect

Question 14.

Electroplating prevents

- (a) corrosion
- (b) passing of current
- (c) dissociation (d) shining

Question 15.

Tin cans, used for storing food, are made by electroplating tin onto iron. Why?

- (a) Tin gives a shiny appearance (b) To make the vessel cheap
- (c) Tin is less reactive than iron. (d) To make the vessel lighter

Question 16.

Chromium plating is done on many objects such as car parts, bath taps, kitchen gas stove etc. Why?

- (a) It does not corrode but prevents scratches
- (b) It looks beautiful
- (c) It costs less
- (d) Articles can be sold at higher price

Question 17.

Why do we add little dilute sulphuric acid to copper sulphate solution during electroplating? (a) To increase acidity

- (b) To increase conductivity
- (c) So that the colour becomes more prominent
- (d) To burn copper sulphate

Question 18

When electrodes are immersed in water and electricity passed, the bubbles formed on the positive terminal is actually _____ gas.

- (a) Hydrogen
- (b) Carbon dioxide
- (c) Oxygen (d) Nitrogen

Question 19.

Tap water is a good conductor of electricity while distilled water is not because

- (a) Tap water contain salts
- (b) Distilled water do not contain salt
- (c) Only (a) is correct (d) Both (a) & (b) is correct

Question 20.

In LEDs, the longer lead (wire) is always connected to the _____ terminal (a) negative

- (b) neutral
- (c) positive
- (d) Any terminal

A) Both assertion and reason are correct and the reason is the correct explanation for the assertion.

B) Both assertion and reason are correct but the reason is not the correct explanation for the assertion.

C) Assertion is correct but reason is incorrect.

D) Assertion is incorrect but reason is correct.

Question 21.

Assertion: There is no current in the metals in the absence of electric fields.

Reason: Motion of free electrons are random.

Question 22.

Assertion: When water falls down as rain drops, many impurities dissolve in it.

Reason: The presence of chemicals and impurities makes rain water a good conductor of electricity.

SHORT ANSWER TYPE QUESTIONS

Question 23.

Define good conductors and poor conductors or insulators.

Answer:

The materials that conduct electricity through them are called good conductors whereas those that do not conduct electricity are called poor conductors or insulators. For example, copper, brass, aluminium, iron, etc., are conductors whereas rubber, plastic, wood, air, etc., are insulators.

Question 24.

How is the conductivity of liquids tested?

Answer:

The free ends of the tester is dipped in the liquid. If the bulb glows, the liquid is said to be a conductor. If not, it is an insulator.

Question 25.

Show with the help of a diagram that lemon juice and vinegar are good conductors of electricity.

Answer:

When the ends of a tester is dipped in lemon juice or vinegar, the bulb glows. This process indicates that lemon juice and vinegar, both, are good conductors of electricity.

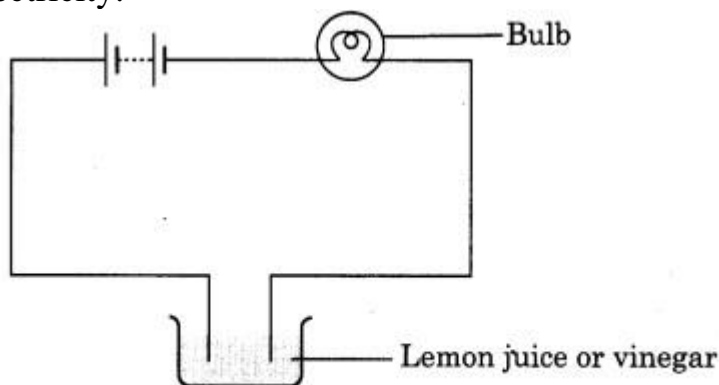


Fig. 14.8 Testing conduction of electricity in lemon juice or vinegar

Question 26.

What is an LED? Why is it preferred to other type of bulbs?

Answer:

The electric device which is used in the tester instead of bulb is an LED. Its full form is Light Emitting Diode.

It is preferred to other bulbs as it can glow even when weak or less current flows through it.

Question 27.

Explain the conductivity of water.

or

Normal water conducts electricity while the pure or distilled water does not.

Explain why?

Answer:

Normal water that we get from sources such as taps, handpumps, wells, ponds, etc., is not pure. It may contain several salts dissolved in it naturally. This water is thus good conductor of electricity. The pure or distilled water is free of salts and is a poor conductor.

Question 28.

Give an example of chemical effect of the electric current.

Answer:

The passage of an electric current through a conducting solution causes chemical reactions as a result, bubbles of a gas are formed, or deposits of metal are seen on electrodes or changes in colour of solution, may occur. These are some of the chemical effects of electric current.

Question 29.

What is electroplating? What are its uses?

Answer:

The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating.

Electroplating is a very useful process. This is used to make objects appear shiny and resistant to scratches. It prevents corrosion.

Question 30.

What happens when electric current is passed through the copper sulphate solution?

Answer:

When electric current is passed through the copper sulphate solution, copper sulphate dissociates into copper and sulphate. The free copper gets drawn to the electrode connected to the negative terminal of the battery and gets deposited on it.

ANSWER (MCQs)

1.A 2. A 3. D 4. A 5.B 6. B 7. B 8. A 9. D 10. B 11. D 12. D 13.A 14. A 15.C
16. A 17. B 18. C 19. D 20. C



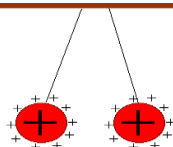
CHAPTER – 15

SOME NATURAL PHEOMENON

FOCUS POINTS:

- 1- TWO TYPES OF ELECTRIC CHARGES- There are two types of charges-

positive charge and negative charge.



These charges can be generated on some objects by rubbing. When objects are rubbed, they attract light objects like pieces of paper. This process is called charging by friction. For example-charge found on plastic ruler by rubbing it on dry hair is



negative charge and attracts pieces of paper.

- 2- STATIC ELECTRICITY- In static electricity, the electric charges remain at rest and these charges do not move. Static electricity deals with the properties of charges at rest.
- 3- PROPERTIES OF ELECTRIC CHARGES AT REST-

- Similar charges repel each other.
- Unlike charges attract each other.
- A charged body can attract an uncharged (neutral) body.

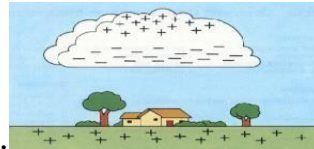


- 4- CURRENT ELECTRICITY-In current electricity, the electric charges are in motion and produce electric current. Or we can say that electric current is the motion of charges through a conductor.
- 5- EARTHING- The process of transfer of charges from a charged object to the Earth is called Earthing.
- 6- Transfer of charge: -When a charged body is brought in contact with an uncharged body charge pass from the charged body to the uncharged body. This method of charging a body is called charging by contact or conduction. If a body is charged by contact it gets the same charge as the charged body. We can observe the transfer of charge by using an electroscope. If a charged plastic rod is brought in contact with an electroscope, the charges are transferred to the metal strips and they repel each other. This is because both the metal strips get the same charge and they repel each other.



7- LIGHTNING-The process of electric discharge between clouds and Earth or

between different clouds is known as lightning.



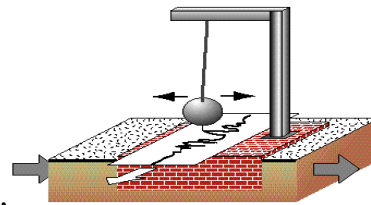
8- EARTHQUAKES-A sudden shaking or tremors of Earth's crust caused due to



disturbance deep inside Earth's crust.

SEISMIC WAVES-Tremors of an Earthquake produce waves on the surface of the earth. These waves are called seismic waves.

9- SEISMOGRAPH- An instrument which is used to record seismic waves



produced due to tremors of an Earthquake.

10- RICHTER SCALE-The scale which is used to express power of an Earthquake. The destructive earthquakes have magnitudes higher than 6 on Richter scale. An increase of 2 in magnitude means 1000 times more destructive energy.

11- THUNDERSTORM- A storm accompanied by thunder and lightning.

VERY SHORT ANSWER TYPE QUESTIONS

Q1- Name two natural phenomena which can be destructive- Ans- Earthquake and thunderstorm.

Q2- Name two types of electric charges- Ans-
positive charge and negative charge

Q3-Name the device which is used to test whether an object is charged or not.

Ans- An Electroscope.

Q4- Mention one application of Earthing.

Ans- Earthing through a metal rod is provided in buildings to protect us from electric shocks if there is any leakage of electric current.

Q5-What are tectonic plates?

Ans- The outermost layer of the Earth crust is not in one piece. It is fragmented. Each fragment is called a tectonic plate.

Q6- Name the Scale on which power of an earthquake is measured.

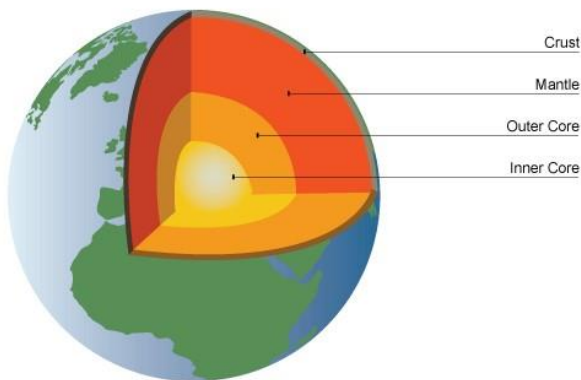
Ans- Richter scale.

Q7-Which are the unsafe places during lightning?

Ans- Tall trees, elevated places, open vehicles, poles, construction machinery etc

Q8- Identify the part of the Earth's structure which contains tectonic plates. Ans-

Crust



-

Z

Q9 -Name two states of India falling under earthquake prone zone of India.

Ans- Uttarakhand and Jammu& Kashmir.

Q10- What is Tsunami?

Ans- Earthquake generated on the surface of oceans results in huge waves. This is known as tsunami. It can destroy coastal areas.

SHORT ANSWER-TYPE QUESTIONS.

Q1- How is an earthquake generated?

Ans- The plates of the earth crust are in continual motion. When they brush against each other, or collide or a plate goes under or moves away from another plates, a disturbance is generated in the Earth crust. This disturbance creates tremors on the Earth's surface just above the plates causing an earthquake. Q2- How can buildings be protected from lightnings?

Ans-A metallic rod taller than a building is installed on its walls. This rod helps in earthing and protects the building.

Q3- What are seismic zones?

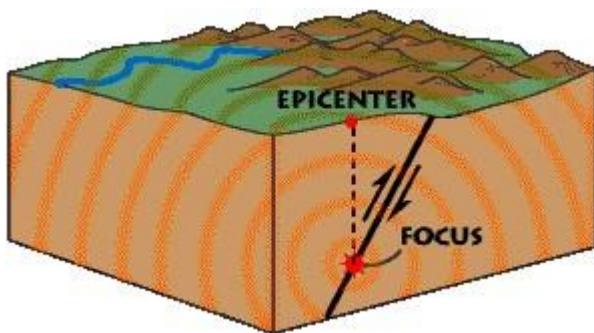
Ans- The boundaries of tectonic plates are weak zones where earthquakes are more likely to occur. These zones are called seismic zones or fault zones.

example- The whole of north-east India, western and central Himalayas in India.

Q4-What is the difference between focus and Epicenter of an earthquake?

Ans-Focus is the point deep inside the earth's crust from where seismic waves are generated during an earth quake.

Epicenter is the place on the surface of the earth vertically above the focus.



Q5- Mention 3 precautions we must take during lightning/ thunderstorms.

Ans- Avoid standing under tall trees and electric poles.

-Electric appliances like TV and computers should be unplugged at the earliest.

- Metal -tipped umbrella should be avoided.

LONG ANSWER-TYPE QUESTIONS.

Q1- What is the reason behind lightning?

Ans-During a thunder-storm, air current moves upward and water droplets move downwards. These vigorous movements cause separation of charges.

Vigorous movements of water droplets in the clouds also cause separation of charges. The negative charges collect near the lower edges of the clouds.

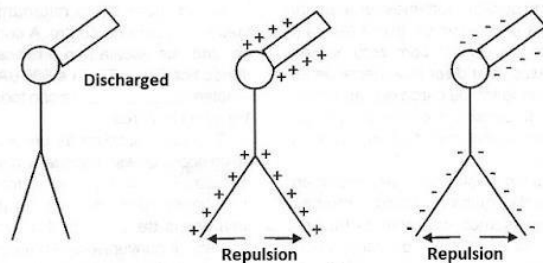
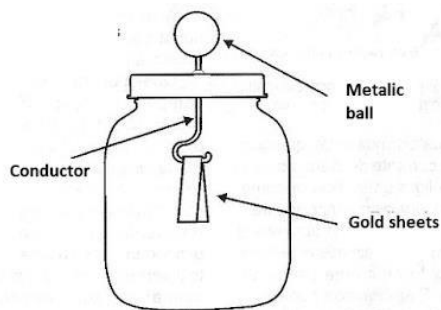
There is collection of positive charges near the ground also.

Due to high accumulation of charges, air insulation breaks and therefore negative and positive charges meet. This phenomenon produces bright light and sound.

This is the reason behind lightning.

Q2- Draw the diagram of a simple electroscope and mention its principle.

Principle- It works on the principle that like charges repel each other and unlike charges attract each other.



CCT

ASSERTION -REASON BASED QUESTIONS. (CCT) CHOOSE THE CORRECT OPTION FROM THE GIVEN 4.

- (a) Both assertion and reason are correct and reason is the correct explanation of the assertion.
- (b) Both assertion and reason are correct but reason is not the correct explanation of the assertion.
- (c) Assertion is correct but reason is wrong.
- (d) Assertion is wrong but reason is correct.

1-ASSERTION- When two balloons are charged with a woollen cloth and brought near each other, the balloons repel each other.

REASON- like charges repel each other.

Answer 1- option a

2-ASSERTION- The gold leaf foil strips of an electroscope open up when a charged body is tested.

REASON- The charged body which is tested by an electroscope and the foil strip always have different charges.

Answer 2 - option c

3-ASSERTION- During a thunder storm hot air currents move upward and water droplets move down wards.

REASON- Thunderstorm may be accompanied by lightning.

Answer 3- option b

4-ASSERTION – Stepping out of vehicles during lightning is dangerous.

REASON – Our body can act as a conductor for earthing during lightning.

Ans 4- option a

5-ASSERTION – The process of transferring of charge always occurs from cloud to earth only.

REASON- Lightning conductors protect us from effects pf lightning.

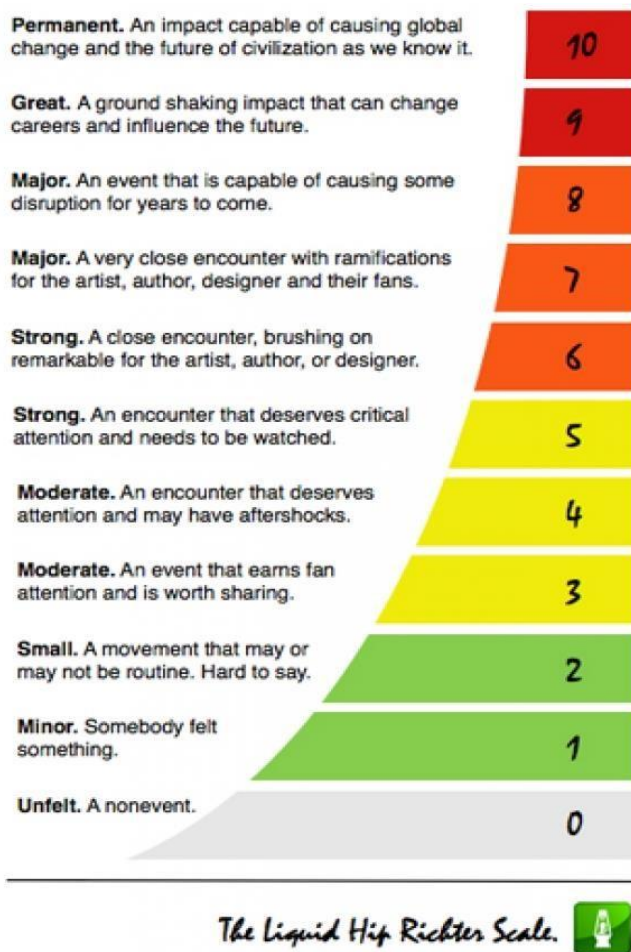
Ans5 -option d.

CASE STUDY BASED QUESTION- Test yourself (5 marks)

Read the paragraph and analyze the graph to answer the given questions.

The destructive energy of an earthquake is measured by the Richter scale. This scale has the readings from 1 to 10.

The reading of magnitude 3 on the Richter scale would be recorded by a seismograph. If the Richter scale gives a reading of magnitude 3, then the earthquake is not likely to cause much damage. Generally, earthquake of magnitudes higher than 5 is considered destructive in nature. An increase of 2 in magnitude means 1000 times more destructive energy.



Q1- State the minimum and maximum magnitude reading given on the above

Richter scale.

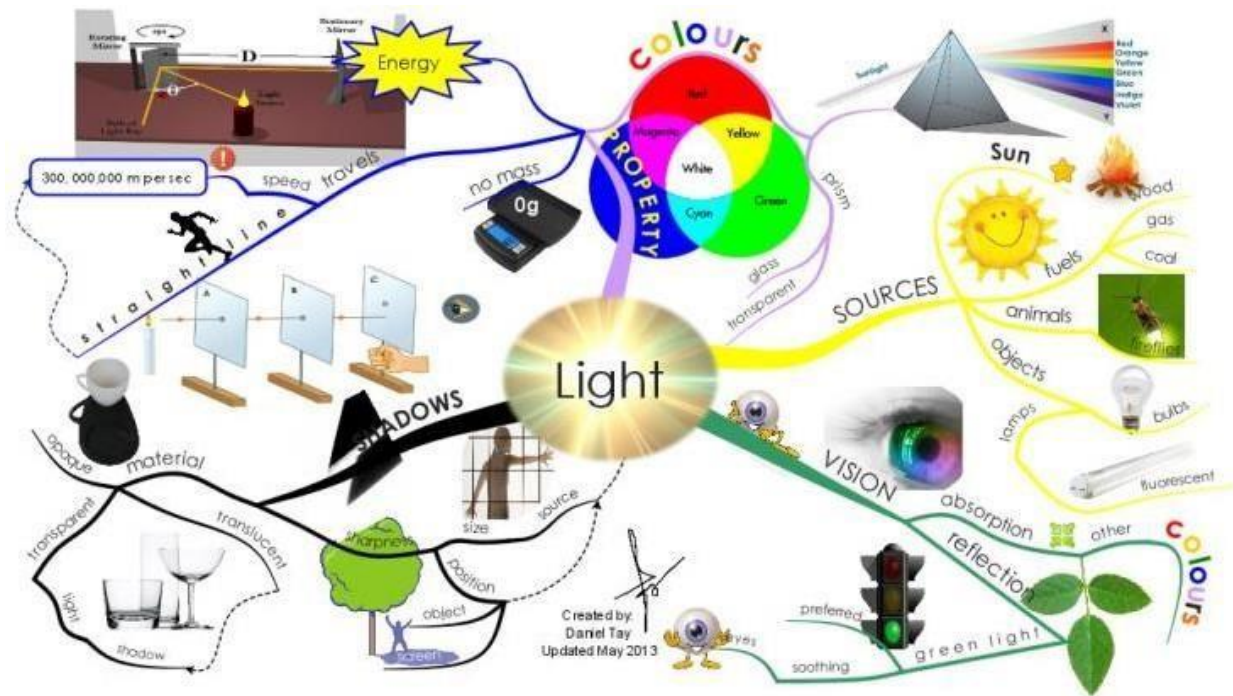
Q2- If the destructive energy at a given place is 'X' during an earthquake showing a magnitude of 5 on a Richter scale, what will be the destructive energy if the magnitude is 7 on the Richter scale?

Q3-Mention the colour depicted to show no recording on a seismograph.

Q4- A place has recorded a 5-magnitude earthquake on a Richter scale. What steps should be taken there?

Q5- Death toll will be high if the Richter scale reading is above_____.

Chapter - 16 LIGHT



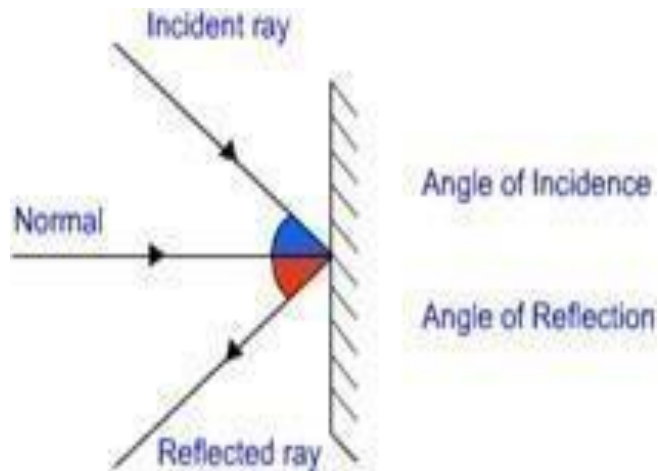
Concept Map

Light: -it is a source of energy which enables us to see the objects and beautiful world around us.

Characteristics of light: -

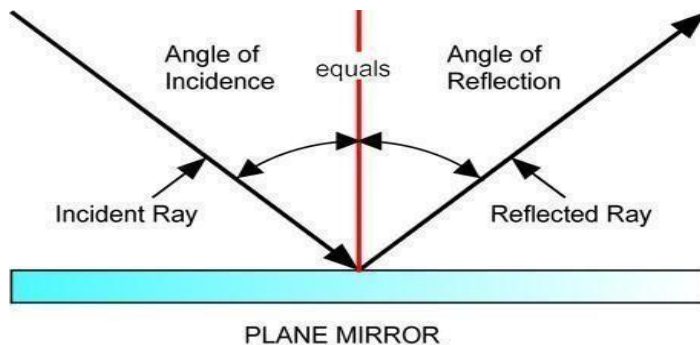
- (i) When light falls on objects, it reflects the light and when the reflected light reaches our eyes then we see the objects.
- (ii) Light travels in straight line.
- (iii) The common phenomena of light are formation of shadows, formation of images by mirrors and lenses, bending of light by a medium, twinkling of stars, formation of rainbow etc.
- (iv) Light comes from sources such as Sun, moon, lamps and Fire

REFLECTION: -The bouncing back of rays of light from a polished and shiny surface is called reflection or reflection of light. It is similar to bouncing back of a football after colliding with a wall or any hard surface.



Laws of Reflection of light:

- The angle of incidence is always equal to the angle of reflection.
- The incident ray, reflected ray and normal to the point of incidence to the reflecting surface all lie in same plane.



Types of Image formed by mirrors:

Real Image: Image which is formed in front of the mirror and it can be obtained on a screen is called real image.

Virtual Image: Image which is formed behind the mirror and cannot be obtained on a screen is called virtual image

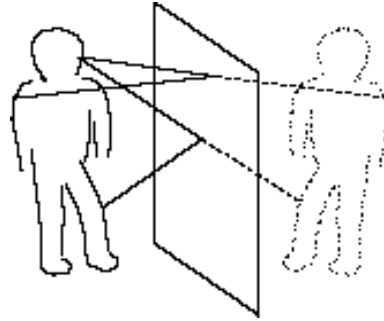
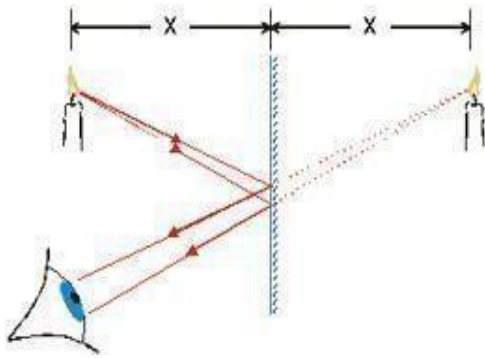
IMAGE FORMED BY PLANE MIRROR-

A plane mirror is a [mirror](#) with a flat ([planar](#)) reflective surface. For [light rays](#) striking a plane mirror, the angle of [reflection](#) equals the angle of incidence.

Characteristics of Image Formed By Plane

Mirror:-

- The image is erect.
- The image is same size as the object.
- The image is at the same distance from the mirror as the object is in front of it. For example if you are standing at a distance of 1 m from the plane mirror your image will be formed at a distance of 1m behind the mirror.
- The image is virtual (cannot be obtained on a screen).
- The image is laterally inverted.

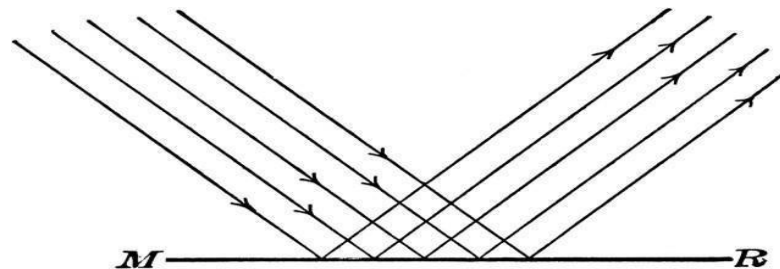


Lateral Inversion-lateral inversion is the visual illusion that right side of the object appears as left side and left side appears as right side. This is known as lateral inversion.



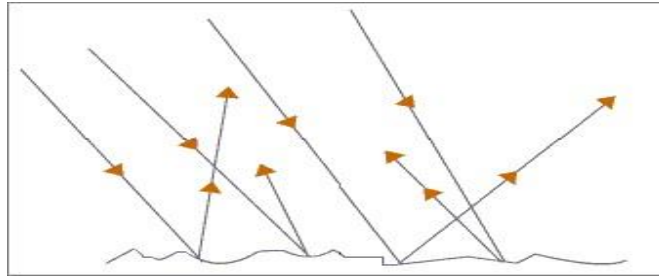
Regular and Diffused Reflection:-

Regular reflection:-When all the parallel rays reflected from plane surface are parallel is called **Regular Reflection**. It is caused by the smoothness of the reflecting surface.



Diffused Reflection

When all the parallel rays reflected from plane surface are not parallel is *called Diffused Reflection*. It is also known as **irregular reflection**. It is caused by **the irregularities in the reflecting surface**.



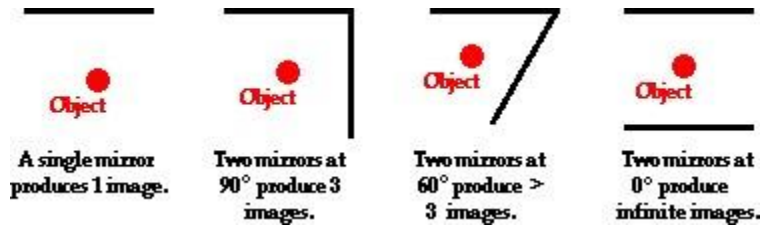
KALIEDOSCOPE

A kaleidoscope is an optical instrument, typically a cylinder with [mirrors](#) containing loose, colored objects such as [beads](#) or [pebbles](#) and bits of glass. As the viewer looks into one end, [light](#) entering the other end creates a colorful pattern, due to repeated [reflection](#) in the mirrors.



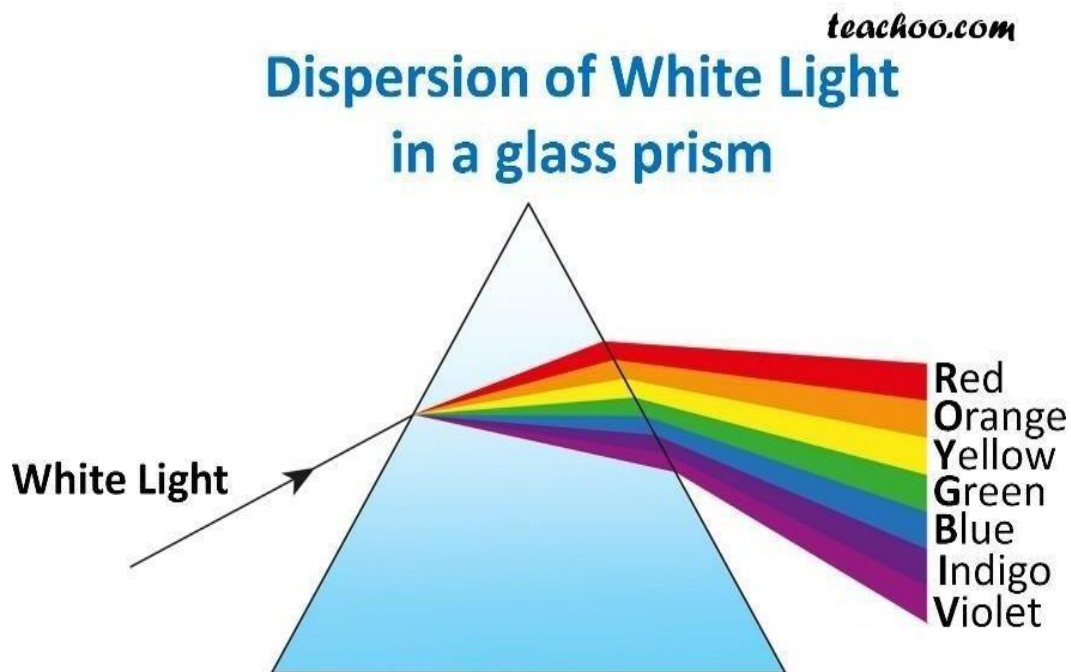
MULTIPLE IMAGES

Besides right-angle mirror systems, there is a wealth of other multiple mirror systems that involve two or more mirrors. If two plane mirrors are placed together on one of their edges so as to form a right-angle mirror system and then the angle between them is decreased, some interesting observations can be made. One observes that as the angle between the mirrors decreases, the number of images that can be seen increases. In fact, as the angle between the mirrors approaches 0 degrees (i.e., the mirrors are parallel to each other), the number of images approaches infinity.



DISPERSION OF LIGHT

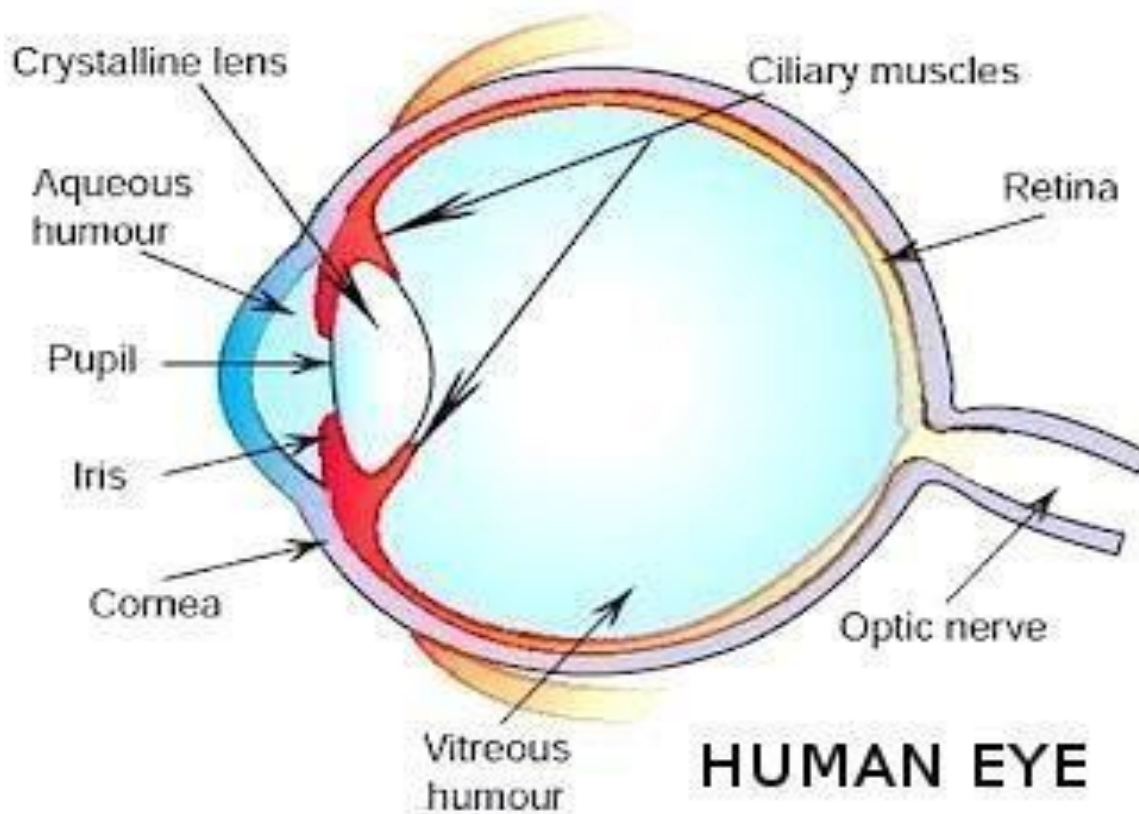
Visible light, also known as white light, consists of a collection of 7 components of colours. These colours are often observed as light passes through a triangular prism. Upon passage through the prism, the white light is separated into its component colours - red, orange, yellow, green, blue, Indigo and violet. The splitting of visible light into its different colours after passing through a glass prism is known as **dispersion**.



EYE-

The **human eye** is an [organ](#) that responds to [light](#) and helps us to see objects. The important part of eye are Cornea, Iris, Pupil, lens, retina and optic nerve.

The transparent front part on the white outer coat of eye is called the Cornea. The dark muscular structure behind the cornea is Iris. The small opening in the iris is called pupil. Its size is controlled by the iris. Behind the pupil there is a lens which is thicker in the middle. The muscles that holds the lens in its place are called ciliary muscles. The lens focuses light on a layer at the back of the eye called the retina. It contains several nerve cells.



Care of eyes: -

- i. If there is any problem of the eyes, have a check-up and use suitable spectacles if advised.
- ii. Too little and too much light is bad for the eyes.
- iii. Do not look at the sun or very bright light directly.
- iv. If dust particles enter the eye do not rub the eyes. Wash your eyes with clean water.
- v. Always read at a normal distance. Do not read by keeping the book too close to the eyes or keeping it too far.
- vi. Deficiency of Vitamin A causes night blindness. So, take food rich in Vitamin A.

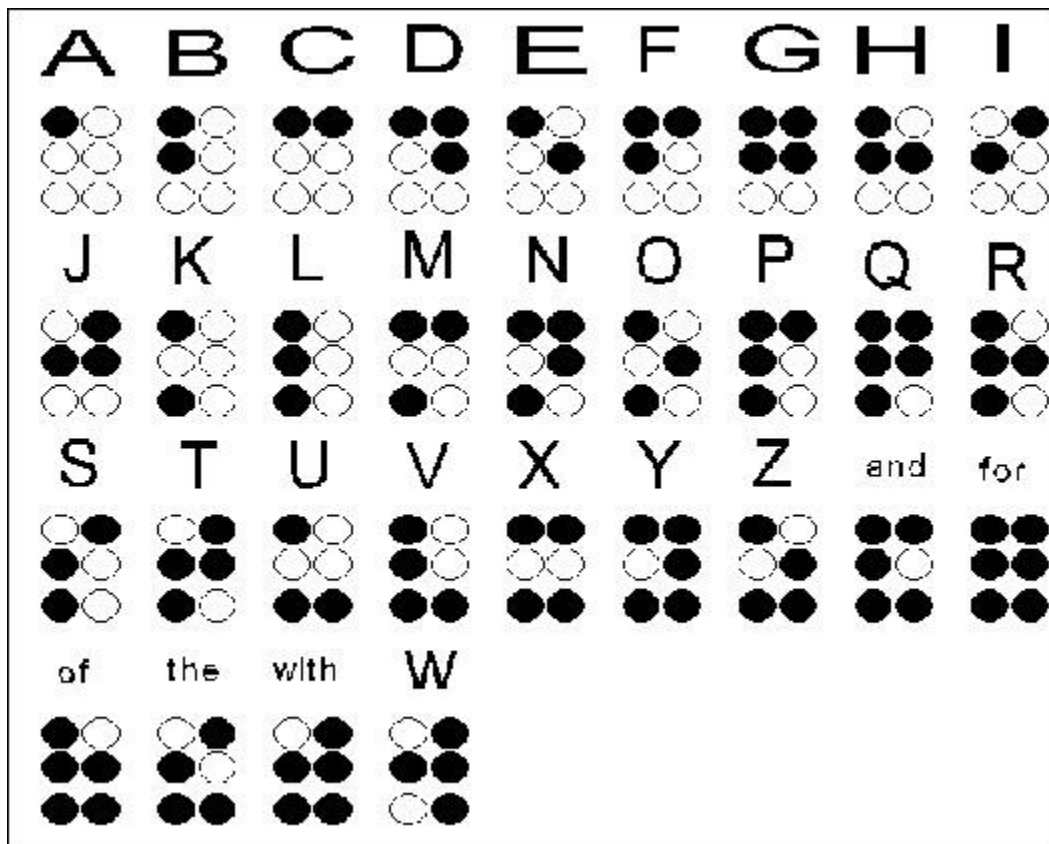
Causes of Eye Problems

The various causes of various eye problems are:

- Reading in dim light .
- Working on computer for longer periods .
- Inadequate diet specially the diet deficient in vitamin A .
- Watching television from close.

Braille system (Louis Braille) :-

Braille system is a system used by visually challenged persons (blind persons) to read and write. It has 63 dot patterns which represents alphabets, common words or signs. The dots are arranged in cells of two vertical rows of three dots each. The dots are raised slightly so that the words can be recognised by touching.



Question Bank

Multiple Choices question

1) We are able to see an object due to the presence of

- a) light
- b) dark
- c) refraction
- d) object

Ans (a)

2) The bouncing back of light into the same medium is called

- (a) refraction
- (b) reflection
- (c) dispersion
- (d) diffraction

Ans (b)

3) A mirror has ----- surface.

- (a) rough
- (b) polished
- (c) dark
- (d) all of these

Ans (b)

4) Maximum part of light is reflected by

- (a) opaque object
- (b) translucent object
- (c) transparent object
- (d) all of these

Ans (c)

5) Beam of light striking the reflecting surface is called

- (a) incident ray
- (b) reflected ray
- (c) refracted ray
- (d) normal ray

Ans (a)

6. The back side of a plane mirror contains

- (a) gold coating
- (b) silver coating
- (c) aluminium coating
- (d) copper coating

Ans (b)

7. The perpendicular drawn to the reflecting surface is called

- (a) normal
- (b) incident ray
- (c) reflected ray
- (d) none of these

Ans (a)

8. There are _____ laws of reflection.

- (a) one
- (b) two
- (c) three
- (d) four

Ans (b)

9. The angle of incidence is always ----- to the angle of reflection.

- (a) greater
- (b) smaller
- (c) equal
- (d) none of these

3. Why it is difficult to see objects in a room when you come outside on a bright sunny day?
4. Explain how Braille system enables the visually challenged people to read and write.
5. Explain the laws of reflection with the help of a suitable diagram.

CHAPTER 17 STARS AND THE SOLAR SYSTEM

FOCUS POINTS:

Celestial objects: -

The objects in the sky like galaxies, stars, planets, satellites, asteroids, meteors, comets etc. are called celestial objects.

Galaxies: -

A galaxy is a very large group of stars containing billions of stars. There are billions of galaxies in the universe. They are of various shapes and sizes.

Stars: -

Stars are celestial objects which emit light of their own. They are of different colours. The sun is also a star. It appears large because it is the nearest star to the earth. The other stars appear very small because they are millions of times away from the sun.

Very large distances are measured in a unit called **light year**. It is the distance travelled by light in one year. The speed of light is 3,00,000 km per second. The sun is 8 light minutes away from the earth. The next nearest star Alpha Centauri is about 4.3 light years away from the earth.

Stars appear to move from **east to west**. This is because the earth rotates from west to east.

There is a star in the sky called the Pole star (Polaris) which does not appear to move. This is because the pole star is located in the direction of the north pole of the earth's axis.

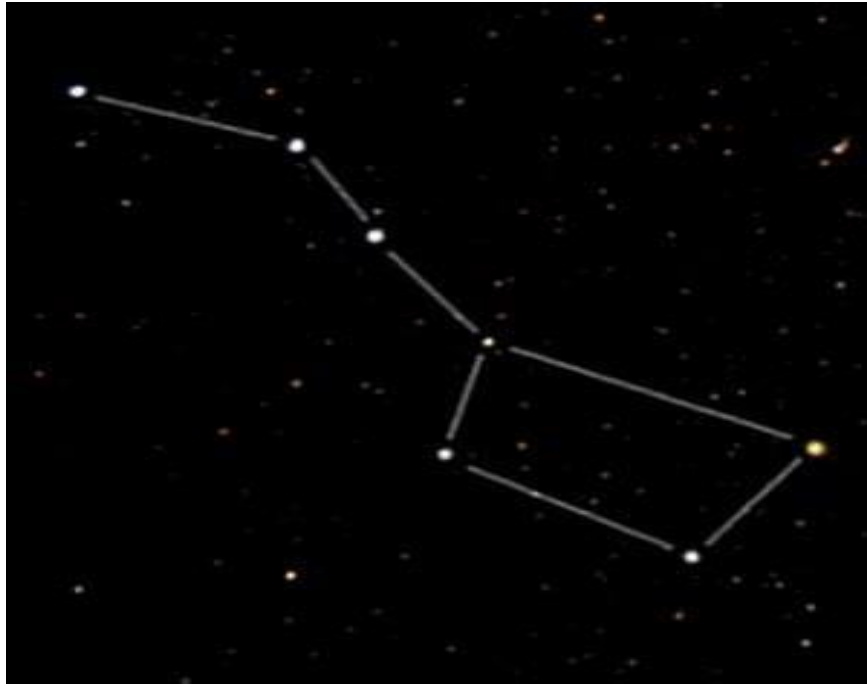
Constellations: -

Constellation is a small group of stars that has a recognizable shape. E.g.: - Ursa Major, Orion, Cassiopeia, Leo Major, Ursa Minor etc.

Ursa Major: -

Ursa Major is also called Great Bear, Big Dipper or Saptharishi. It has seven main stars and appears like a big ladle or dipper. There are three stars in the handle and four stars in the bowl of the ladle

We can locate the **Pole star** (Polaris) by extending an imaginary line from the last two stars of Ursa Major towards the north



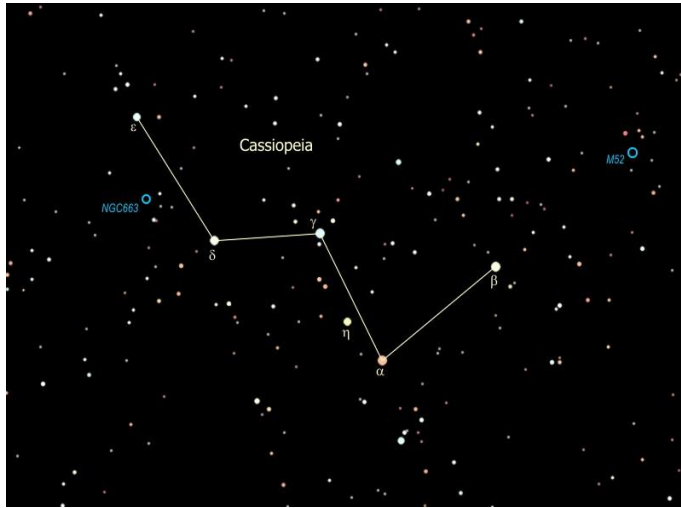
Orion: -

Orion is also called Hunter. It has eight main stars and has the shape of a hunter. The three stars in the middle represents the belt of the hunter.

We can locate the brightest star in the sky **Sirius** by extending an imaginary line through the three middle stars of Orion.



Cassiopeia: -

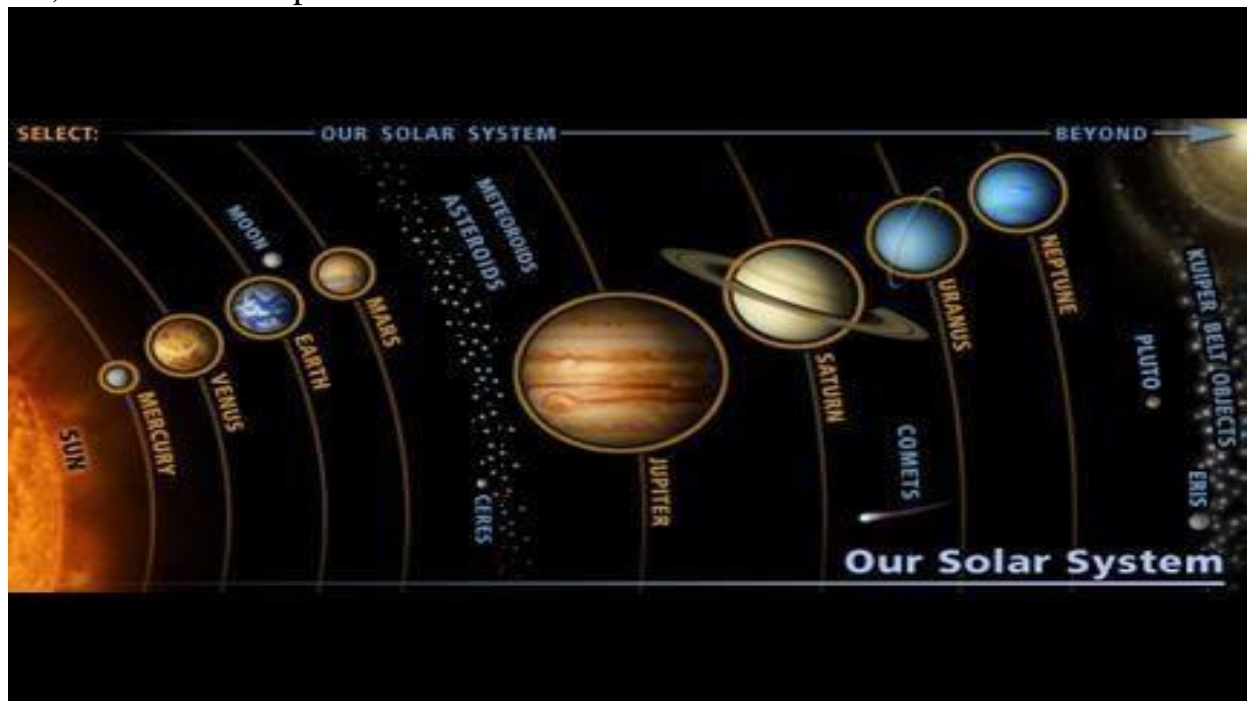


Cassiopeia have five main stars. It appears like a distorted W or M

The solar system: -

The sun and the celestial bodies which revolves around it forms the solar system. It has a large number of bodies like planets, satellites, asteroids, meteors, comets.

The eight planets in the order of their distance from the sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune



The Sun: -

The sun is the nearest star from us. It is continuously emitting huge amount of heat and light. It is the main source of heat and light for planets

The Planets: -

Planets are celestial objects which revolves around a star. The path along which a planet revolves is called orbit. The time taken to complete one orbit is called period of revolution. Planets also rotates on its own axis. The time taken for one rotation is called period of rotation. Some planets have their own satellites revolving around them called as **natural satellites**.

Satellites: -

A celestial body revolving around another celestial body is called a satellite. The moon is a natural satellite of the earth.

There are many man-made satellites revolving around the earth. They are called **artificial satellites**.

The Moon: -

The moon is a natural satellite of the earth. It revolves around the earth. The moon completes one rotation on its axis as it completes one revolution around the earth.

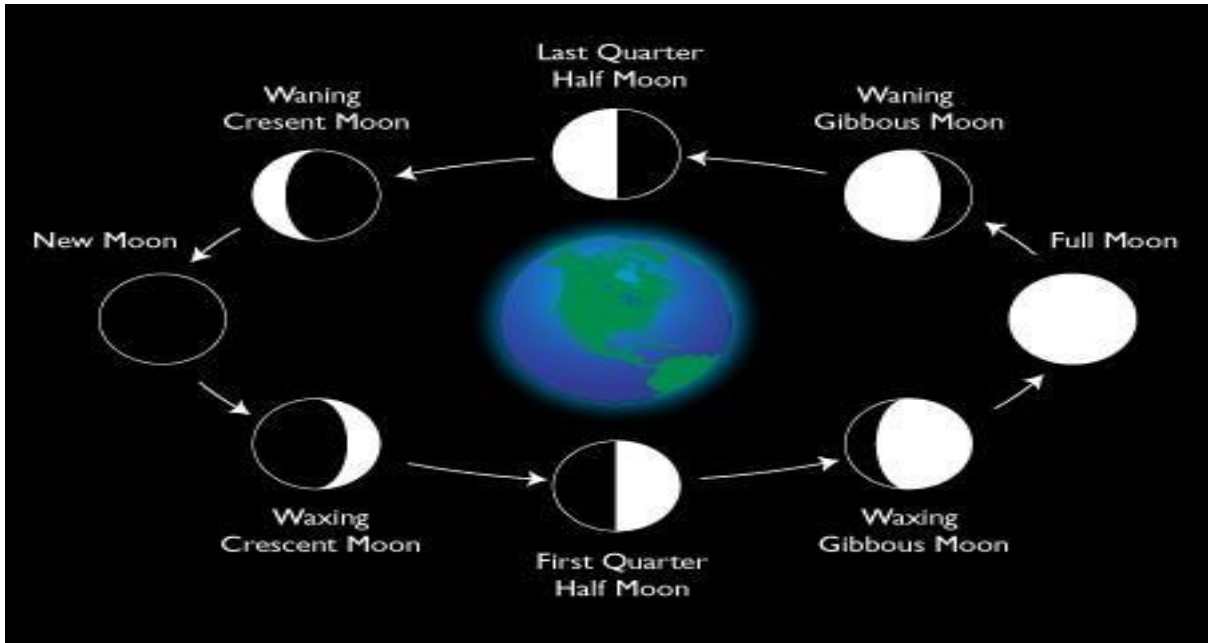
Phases of the moon: -

The changes in the shape of the bright part of the moon is called phases of the moon. It is caused due to the revolution of the moon around the earth and the relative positions of the earth and the sun.

The day on which the whole disc of the moon is visible is called full moon day.

Then the bright part of the moon becomes thinner and thinner and on the fifteenth day the moon is not visible. This is called new moon day.

Then a small part of the moon becomes visible as crescent moon. Then again, the bright part becomes larger and larger and on the fifteenth day it once again becomes full moon.



The moon's surface: -

The moon's surface is dusty and barren. There are many craters of different sizes. It also has many high mountains. It has no atmosphere or water. In 1969 Neil Armstrong was the first man to land on the moon. He was followed by Edwin Aldrin.

Planets: -**Mercury: -**

Mercury is the nearest planet to the sun. It is the smallest planet. It has no satellite.

Venus (Shukra): -

Venus is the nearest planet to the earth. It is the brightest planet. Since it is seen in the eastern sky before sunrise and western sky before sunset, it is called morning star or evening star. It has no satellites.

Earth (Prithvi): -

The earth is the only planet where life is known to exist. It has the right temperature, atmosphere, water and a protective ozone layer. The earth has a tilted axis which is responsible for the seasons on the earth. The earth has one satellite (moon).

Mars (Mangal): -

Mars is the next planet outside the orbit of the earth. It appears slightly reddish and is called the red planet. It has two satellites.

Jupiter (Brihaspathi): -

Jupiter is the largest planet of the solar system. It is about 1300 times larger than the earth. It has faint rings around it. It has a large number of satellites.

Saturn (Shani): -

It is yellowish in colour. It has several rings around it. It is the least dense among all the planets. It has several satellites.

Uranus: -

Uranus has the highest tilted orbit. It rotates from east to west. It has several satellites.

Neptune: -

Like Uranus, Neptune has a highly tilted orbit. It is bluish green in colour. It has several satellites.

Asteroids: -

Asteroids are small objects that revolve around the sun between the orbits of Mars and Jupiter.

Comets: -

Comets are objects which revolve around the sun in highly elliptical orbits. Their period of revolution around the sun is very long. It has a bright head and a long tail. The tail grows longer as it approaches the sun and is directed away from the sun.

Meteors and Meteorites: -

A meteor is a small object that enters the earth's atmosphere at high speed and burn up completely due to friction producing a bright streak for a short time. So, they are also called shooting stars.

Meteorite: -

Some meteors are large and they do not burn up completely and fall on the earth. The body that reaches the earth is called meteorite.

Artificial satellites: -

Artificial satellites are man – made satellites launched from the earth. They revolve around the earth at a lower orbit. India has built and launched several artificial satellites.

Aryabhata was the first Indian satellite. Some other satellites are APPLE, INSAT, EDUSAT,

IRS etc.

Artificial satellites are used in weather forecasting, telecommunication, remote sensing, transmitting radio and TV signals etc.

QUESTIONS FOR PRACTICE

Fill in the blanks with suitable word/s

1. First artificial satellite launched by India is_____.
2. Stars have their own_____.
3. _____is the brightest object in the night sky.
4. The various shapes of the brightest part of moon are called _____
5. The path of the planets is known as_____.

Answer:

1. Aryabhata
2. light
3. Moon
4. phases of moon
5. orbits

Multiple Choice Questions

1. Name the star other than sun that is nearest to the Earth.
 - (a) Pole star
 - (c) Alpha Centauri
 - (b) Cassiopeia
 - (d) Orion
2. What is our Galaxy known as?
 - (a) Sun galaxy
 - (b) Earth galaxy
 - (c) Milky Way
 - (d) Constellation
3. ___is the term used for celestial bodies that revolve around the Sun in highly elliptical orbit. (a) Comet

Asteroid	Comet
(i) Asteroids are made up of metals and rocky material.	(i) Comets are made up of ice, dust and rocky material.
(ii) It rotates nearer to the sun.	(ii) It rotates farther from the sun.
(iii) It does not has any tail of volatile material.	(iii) It has tail of volatile gases when passing close to the sun.

Galaxy	Constellation
---------------	----------------------

(b) Meteors

(c) Asteroids (d) Planets

ANSWERS

1. Alpha Centauri
2. Milky Way
3. Comet

Differentiate between the following:

- (a) Asteroid and comet
- (b) Galaxy and constellation

(i) It is a collection of billions of stars.	(i) It is a collection of only a few stars.
(ii) It does not resemble shape of human beings or animals.	(ii) It is arranged in patterns resembling human beings or some animals.
(iii) There are billions of galaxies in the Universe.	(iii) There are only about 88 constellations.



Chapter- 18

POLLUTION OF AIR AND WATER

INTRODUCTION:

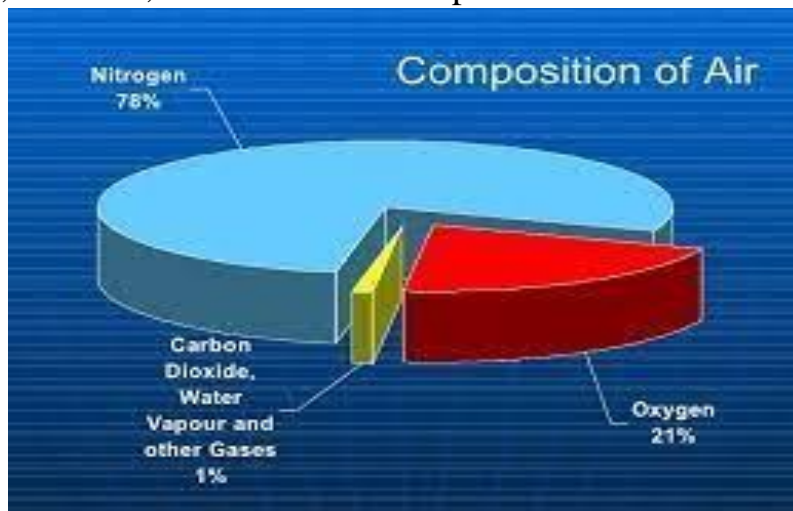
As you know that earth is the only planet on which life is present. Due to some of our activities we are creating pollution on earth. We are damaging our earth. So, in this chapter we will study that how air and water pollution is going to damage our earth and our environment.

AIR:

As we know that our earth is surrounded by an envelope of gases which is known as atmosphere. This combination of various gases present in our atmosphere is known as air.

COMPOSITION OF AIR:

Air consists of about 78% nitrogen and 21% oxygen and rest 1% comprising of carbon dioxide, argon, methane, ozone and water vapour etc.



AIR POLLUTION:

Air pollution can be defined as contamination caused in the air by unwanted substances (pollutants) which have a harmful effect on both the living and the non-living things.



Various types of air pollutants are:

SMOG:

A thick fog-like layer in atmosphere especially during winters. This is smog which is made up of smoke and fog. It may contain oxides of nitrogen which combine with other air pollutants and fog to form smog. The smog causes breathing difficulties such as asthma, cough and wheezing in children.

CHLORO FLOURO CARBONS:

CFCs are used in refrigerators, air conditioners and aerosol sprays. The vapours go in the upper atmosphere and deplete ozone layer. CFCs damage the ozone layer of the atmosphere. Depletion of ozone layer causes skin disorders.

CARBON MONOXIDE:

Carbon monoxide is produced from incomplete burning of fuels such as petrol and diesel. When there is lack of oxygen then it results into incomplete burning of fuels which results into production of carbon monoxide instead of carbon dioxide. It is a poisonous gas. It reduces the oxygen carrying capacity of the blood. This can lead to death also.

UNBURNT PARTICLES:

Automobiles which burn diesel and petrol also produce tiny particles which remain suspended in air for long time. These particles are also called SPM (Suspended particulate matter). They reduce visibility. When inhaled they causes disease like bronchitis. Such particles are also produced during industrial process like steel making and mining. Power plants give out tiny ash particles which also pollute the atmosphere and they are so harmful that if inhaled can cause various diseases.

CASE STUDY: TAJ MAHAL

Taj Mahal is a very beautiful monument in our country. This monument known for its white beauty has now started to turn yellowish-brown due to deposition of dust and carbon containing particles which are emitted when fossil fuels, biomass or garbage is burnt. It is suffering from monument cancer and the main reason behind this corrosion is air pollution.

**ACID RAIN:**

It is one of the main causes of monument cancer. The exhaust which is released from the vehicle contains nitrogen dioxide and sulphur dioxide, as these gases are lighter they rise up in the sky.

-
- When rain water mixes with pollutants present in air. It forms nitric acid and sulphuric acid
-

resulting into acid rain.

- So, now the rain water no longer remains a pure water it turns into acidic water.

EFFECTS OF ACID RAIN:

i) It leads to monument cancer, as it combines with marble damaging the calcium carbonate and deteriorate it. ii) It affects pH of soil and makes it unfit for growing plants and if there will be no plants it will lead to ecological imbalance. iii) It affects aquatic life too. When acid rain occurs, it disturbs the pH balance of water bodies resulting into damage to the aquatic life. One more issue of concern is global warming. So, let's see what is global warming.

GLOBAL WARMING:

i) It is the increase in the concentration of certain gases like carbon dioxide, methane etc. in air due to which infra-red rays get trapped in it and it leads to increase in overall temperature of earth. ii) The rays that come from the sun consist of visible light, infra-red rays are visible light reaches earth's surface. On reaching earth, the infra-red rays are reflected back and a portion of it is absorbed by earth's surface.

iii) The reflected ones when pass through earth's atmosphere get trapped inside the gas molecules. As we know, it leads to heating effect. Therefore, the overall temperature of earth's surface rises.

One of the applications of global warming is green-house effect.

GREEN HOUSE EFFECT:

One of the reasons for global warming is greenhouse effect. In winters, it is advised to keep plants in green house only. The roof allows infra-red rays to enter but after reflection they are not allowed to go back. As a result, they get trapped inside the green house and growth of plants is stimulated because optimum temperature is achieved inside the green house.

STEPS TO REDUCE AIR POLLUTION:

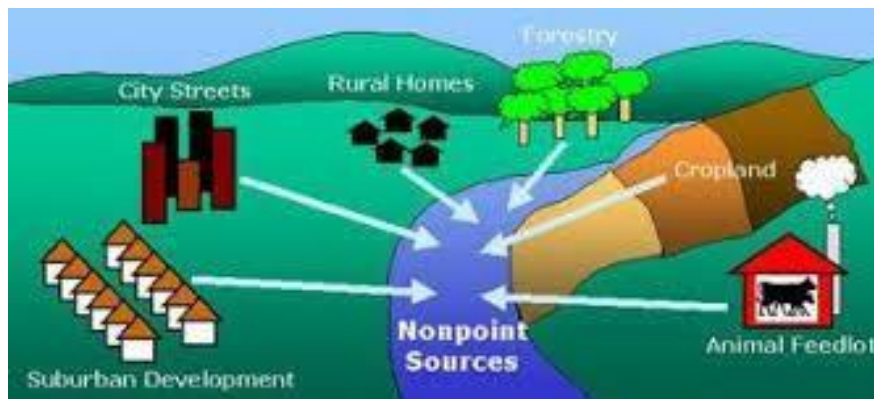
- Use of cleaner fuels like CNG (Compressed Natural Gas).
- Say No to crackers.
- Alternative fuels instead of fossil fuels like solar energy, hydropower and wind energy should be used.
- Plant trees as this will lead to healthy environment.
- Do not burn dry leaves.

WATER:

As you all know that water is very important because it is used for various purposes such as drinking, bathing, washing, etc. But due to some of our activities water is also getting polluted.

WATER POLLUTION:

Pollution of water can be defined as contamination of water caused due to presence of highly toxic and unwanted pollutants in water, that risk the aquatic life and human life at large.



WATER POLLUTANTS:

Whenever harmful substances such as sewage, toxic chemicals, silt, etc., get mixed with water, the water becomes polluted. The substances that pollute water are called water pollutants. As shown in the image, the waste bottles, wrappers which are thrown into the water causes water pollution due to this the water becomes unfit for drinking.

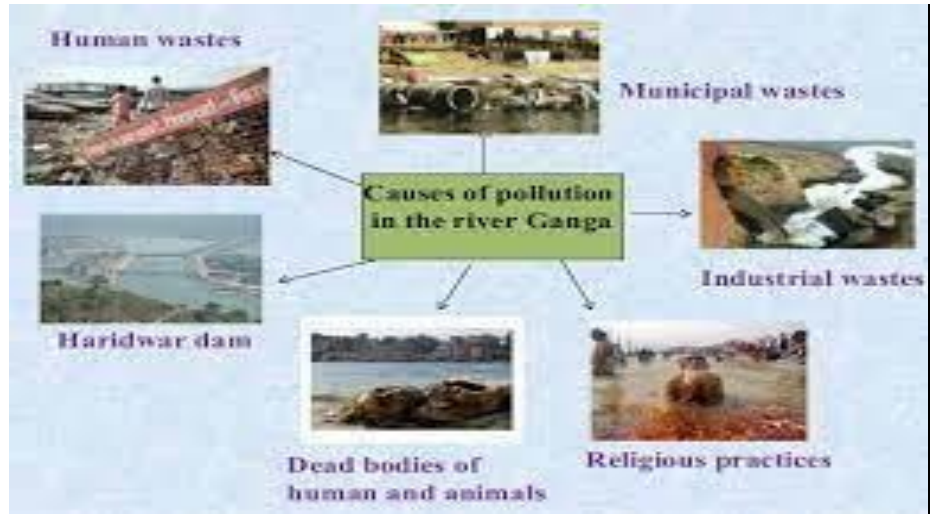
HARMFUL EFFECTS OF WATER POLLUTION:

- It affects the aquatic life.
- It leads to eutrophication. When there is excess discharge of chemicals into the water, this result into excess growth of algae. With the growth of more and more algae a new problem will arise that is the oxygen in the water will reduce and result into death of aquatic animals.
- It also spread lot of water borne diseases.

CASE STUDY-GANGA RIVER:

A serious problem which is faced by this holy river is that it has become a muchpolluted river. World Wide Fund for Nature study found that Ganga is one of the ten most endangered rivers in the world. The towns and cities, through which the river flows, throw large quantities of garbage, untreated sewage, dead bodies and many other harmful things, directly into rivers. All this is leading towards the pollution in the river Ganga.

To control pollution level in the Ganga, A programme was initiated known as the **Ganga Action Plan**.



GANGA ACTION PLAN:

Ganga Action Plan is massive multi-crore project implemented in 1985 which has undertaken to make the river Ganga pollution free.

As you can see people are voluntarily contributing to clean the river Ganga they are cleaning the garbage from the river. So due to this, the Ganga action plan was launched in the year 1985 but what was the aim of this plan? The main aim was to reduce the pollution level of Ganga to make it a clean river. As we know that the increasing population and industrialization have already damaged this mighty river beyond repair. So, the Ganga action plan was not as successful as it was thought.

Therefore, it becomes important for all of us to take a responsibility to keep Ganga clean.

POTABLE WATER:

Water which is suitable for drinking is called potable water. The potable water is fit for drinking because it is clean and transparent. The pH level of this water is 7. There are no microorganisms present in this water. So, how can we make our water safe for drinking purpose? Let's have a look at this.

WAYS TO MAKE WATER FIT FOR DRINKING:

1. **FILTRATION:** - You have already seen how water is filtered. This is a physical method of removing impurities. A popular household filter is a candle type filter. There is reverse osmosis system present in such filters which make water pure.
2. **BOILING:** - Many households use boiling as a method for obtaining safe drinking water. Boiling kills the germs present in the water.
3. **CHLORINATION:** - Chlorination is a commonly used chemical method for purifying water. It is done by adding chlorine tablets or bleaching powder to the water. We must be cautious. We should not use more chlorine tablets than specified.

QUESTION-ANSWERS

Multiple Choice Questions:(1 mark each)

Question 1. Which of the following is a major source of water pollution?

- (a) Sulphur dioxide (b) Nitrogen oxide (c) **DDT** (d) Hydrogen oxide

Question 2. The phenomenon of marble cancer is due to

- (a) soil particles (b) fog (c) CFCs (d) **acid rain**

Question 3. Which gas is the major pollutant of air?

- (a) **Carbon monoxide** (b) Nitrogen (c) Oxygen (d) Propane

Question 4. The solid or liquid particles dispersed in the air are called

- (a) oxides (b) acids (c) hydrocarbons (d) **aerosols**

Question 5. Water containing high salt concentration can be purified by (a) boiling (b) UV radiation (c) filtration (d) **reverse osmosis**

Question 6. The Taj Mahal is being affected due to

- (a) noise pollution (b) **air pollution** (c) water pollution (d) soil pollution

Question 7. Greenhouse gas is

- (a) nitrogen (b) methane (c) carbon dioxide (d) **both (b) and (c)**

Question 8. Pollution of water is due to

- (a) oil refineries (b) paper factories (c) sugar mills (d) **all of these**

Question 9. The percentage of nitrogen in the air is

- (a) 21% (b) **78%** (c) 12% (d) 87%

Question 10. Chlorofluorocarbon is used in

- (a) refrigerators (b) air conditioners (c) aerosol sprays (d) **all of these**

Question 11. Which of the following is not a way to conserve water?

- (a) **Replace** (b) Reuse (c) Reduce (d) Recycle

Question 12. Water suitable for drinking is known as

- (a) impure water (b) pure water (c) **potable water** (d) safe water

Question 13. The contamination of natural environment is known as

(a) pollution

(b) greenhouse effect

(c) global warming

(d) CFCs

Question

14. Agents that pollute water, soil and air are known as
(a) **pollutants** (b) waste (c) effluent (d) garbage

Question 15. Which of the following greenhouse gas is present in very high quantities? (a) Propane (b) Methane (c) Ethane (d) **Carbon dioxide**

VERY SHORT ANSWER QUESTIONS (1 Mark each)

Question 1. Which gas is responsible for depletion of ozone layer?

Answer: Chlorofluorocarbons (CFC's).

Question 2. Which health problem arises by air pollution?

Answer: Respiratory problems like asthma, breathlessness, bronchitis, etc.

Question 3. What is global warming?

Answer: Increasing temperature in atmosphere.

Question 4. What is cause for starting of melting of Gangotri glacier?

Answer: Global warming

Question 5. What does SPM stand for?

Answer: Solid particulate matter.

Question 6. What is the role of activated charcoal in purification of water?

Answer: It removes finest particles suspended in water.

Question 7. Name a greenhouse gas.

Answer: Carbon dioxide, methane, water vapour (any one)

Question 8. What is the formula of ozone?

Answer: O₃

Question 9. Name the agents that pollute air and water.

Answer: Pollutants

Question 10. Name the main air polluting gases.

Answer: Sulphur dioxide, carbon monoxide and nitrogen oxides.

Question 11. Which radiations are absorbed by CO₂?

Answer: Infrared radiations

Question 12. Define eutrophication.

Answer: Enrichment of water bodies with nutrients like nitrates and phosphates is known as eutrophication.

Question 13. Name one major source of water pollution.

Answer: Untreated sewage

Question 14. What is the function of ozone layer?

Answer: Ozone layer protects us from ultraviolet rays of the sun.

Question 15. Name diseases spread through drinking of contaminated water. Answer: Diarrhoea, typhoid, etc.

Short Answer Questions: (2 Marks Each)

Question 1. What do you mean by water pollution?

Answer: When water gets contaminated by unwanted substances which have a harmful effect on

both living and non-living things is referred as water pollution.

Question 2. What is greenhouse effect?

Answer: The reflected sun rays are trapped by the earth's atmosphere. The trapped radiation warms the earth. This process by which the temperature of the earth's atmosphere rises is called greenhouse effect.

Questions 3. What are the main causes of air pollution?

Answer: Following are the main causes of air pollution:

- Poisonous gases which are expelled by various industries.
- Gases emitted by vehicles.
- Smoke and dust which are arising day by day due to human activities
- Smoke emitted by forest fire.

Question 4. What do you mean by air pollution?

Answer: When air is contaminated by unwanted substances which have a harmful effect on both living and non-living things then it is referred as air pollution. Questions 5. What are the factors that are responsible for water pollution?

Answer: Water gets polluted when unwanted and harmful substances are added to the water. Discharging of untreated sewage into the river, leaching of chemicals from agricultural practices and industries, oil spills, etc., causes water pollution.

Questions 6. What are the harmful effects of global warming?

Answer: Following are the harmful effects of global warming:

- It will increase the earth's temperature.
- Increase in earth's temperature may lead to rise in sea level due to melting of glaciers. Rise in sea level will flood the coastal and low-lying areas.
- Global warming may lead to extreme weather other than cold or heat extremes.
- It may also affect many flora and fauna which are sensitive to temperature and their extinction.

Question 7. Which factors decide quality of potable water?

Answer: Potable water is clear, tasteless, odorless, have no contaminants and right pH. It has no harmful minerals or their level is too low to affect human health.

Question 8. What is global warming?

Answer: Carbon dioxide is increasing day by day and it increases the temperature of the earth's atmosphere. It is called global warming. **Long Answer Questions: (5 Marks each)**

Question 1. What do you mean by acid rain? How does it affect both living and nonliving things?

Answer: Due to fossil fuel and industrial combustions that mostly emits nitrogen oxides (NO_2)

and sulphur dioxide (SO₂) into the atmosphere. Water vapours present in atmosphere react with these gases to form nitric acid and sulphuric acid. Normal rain water is slightly acidic with a pH range of 5.3-6.0, because carbon dioxide and water present in the air react together to form carbonic acid, which is a weak acid. When the pH level of rain water falls below this range due to combining with these acids in atmosphere, it becomes acid rain. Acid rain has significant effects on the world environment and public health.

Effect on aquatic environment: Acid rain lowers pH level below 5, most fish eggs cannot hatch. Lowering in pH can also kill adult fish.

Effect on forests: It makes trees vulnerable to diseases, extreme weather, and insects by destroying their leaves, damaging the bark and arresting their growth.

Effect on soil: Acid rain highly impacts soil microbes and biological activity as well as soil chemical compositions, thus affecting crop production.

Effect on architecture and buildings: Acid rain on buildings, especially those constructed with limestone, react with the minerals and corrode them away. This leaves the building weak and susceptible to decay.

Effect on public health: When in atmosphere, sulphur dioxide and nitrogen oxide gases, degrades visibility and can cause accidents, leading to injuries and deaths. Intensified levels of acid depositions in dry form in the air can cause lung and heart problems such as bronchitis and asthma.

Question 2. Write a short note on water pollution.

Answer: Water pollution is the contamination of water bodies (e.g., lakes, rivers, oceans, aquifers and groundwater). This form of environmental degradation occurs when pollutants are directly or indirectly discharged into water bodies without adequate treatment to remove harmful compounds. Water is available both on surface and under the ground. The major pollutants of surface water are toxic and poisonous wastes from households, industries, nuclear wastes, oil spills, agricultural waste, accumulation of heavy metals, chemicals from chemical factories, microorganisms from human faeces, etc. Groundwater is mainly contaminated by leaching of harmful chemicals into the soil. Seepage of sewer near groundwater aquifer contaminates with disease causing microorganisms. Accumulation of heavy metals in soil may also lead to groundwater pollution. Water pollution affects the entire biosphere—plants and organisms living in these water bodies. In almost all cases the effect is damaging not only to individual species and population, but also to the natural biological communities.

Question 3. How can you prevent water pollution?

Answer:

- Be careful about what you throw down your sink or toilet.
- Don't throw paints, oils or other forms of litter down the drain.
- Use environment-friendly household products, such as washing powder, household cleaning agents and toiletries.

-
- Take great care not to overuse pesticides and fertilizers. This will prevent runoffs of
-

the material into nearby water sources.

- By having more plants in your garden, you are preventing fertilizer, pesticides and contaminated water from running off into nearby water sources.
- Don't throw litter into rivers, lakes or oceans. Help to clean up any litter you see on beaches or in rivers and lakes, make sure it is safe to collect the litter and put it in a nearby dustbin.

Question 4. How can you prevent air pollution?

Answer:

- Conserve energy-remember to turn off lights, computers, and electric appliances when not in use. Use energy efficient light bulbs and appliances.
- Limit driving by carpooling, using public transportation, biking and walking.
- Keep your automobile well-tuned and maintained.
- Petrol can be substituted with CNG.
- Make fertilizers of biodegradable wastes instead of burning them.
- Plant more and more trees.

Question 5. Name various techniques used for purification of water.

Answer: Water which looks clean may still have disease-carrying microorganisms and dissolved impurities. So, it is essential to purify water before drinking. Municipal bodies use various physical and chemical processes before supplying water into households.

Boiling: It is a very common practice used for obtaining safe drinking water. Boiling kill the germs present in the water.

Filtration: This is a physical method of removing impurities and in some cases germs also. A popular household filter is a candle type filter.

Chlorination is a commonly used chemical method for purifying water. It is done by adding chlorine tablets or bleaching powder to the water.

Now-a-days filter with reverse osmosis (RO) which causes desalination of water along with activated charcoal (to filter impurities) and ultraviolet lamp (to kill microorganisms) are also used for purification of water.