Chapter 1 CHEMICAL REACTIONS AND EQUATIONS

WORKSHEET 1

1. **Multiple choice questions**

1. Which of the following is an example of heterogeneous mixture?
a) Brine
b) Air
c) Muddy water
d) Vinegar

2. While balancing the chemical equation, we balance number of
a) Atoms
b) Moles
c) Electrons
d) Grams

3. Which of the following is a decomposition reaction?
a) $2H_2 + O_2 \rightarrow 2H_2O$
b) $2Na + Cl_2 \rightarrow 2NaCl$
c) $CaCO_3 \rightarrow CaO + CO_2$
d) $CH_4 + 2O_2 \rightarrow CO_2 + 2H2O$

4. The deteriorating condition of Taj Mahal is a product of a pressing environmental concern, arises from the reaction of sulfur dioxide (SO2) and nitrogen oxides (NOx) in the atmosphere with water. This chemical process leads to the formation of:
a) Sulfuric Acid (H2SO4)
b) Nitric Acid (HNO3)
c) Hydrogen Peroxide (H2O2)
d) Hydrochloric Acid (HCl)

5. In a water treatment plant, calcium carbonate (CaCO3) is added to hard water to remove excess calcium and magnesium ions. This process is an example of a:
a) Combination reaction
b) Decomposition reaction
c) Single displacement reaction
d) Double displacement reaction

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

1. On heating ferrous sulphate crystals in a test tube, one might observe green colour changing to reddish brown colour.
2. By adding few drops of dil. Sulfuric acid, we can make pure water conduct electricity.
3. Two different ions are exchanged in double displacement reactions.
4. Reactions in which hot products are formed are usually exothermic.
5. Reaction of dil. Sulfuric acid and zinc produced sulphur oxide.

3. Fill in the blanks

1. When _____ coloured ferrous sulphate crystals are heated, the colour of crystals changes because it looses water of crystallization.
2. Iron nails dipped into_____ solution is displacement reaction
3. The product of the reaction between hydrochloric acid and sodium hydroxide is _____ and _____.
4. Reaction of silver nitrate and aqueous sodium chloride is a _____ reaction.
5. The gas produced in the inverted test tubes during the electrolysis of water is _____.

4. Correct the given sentences.

1. Decomposition of vegetable matter into compost is a decomposition reaction.
2. Chemical reactions seldom have an impact on our environment.
3. Endothermic reactions release energy in the form of precipitates and product.
4. In a double displacement reaction, two compounds exchange their ions to form new reactants.
5. Chemical reactions can only be represented using words and sentences.

5. Crossword

Across

4. Something which has mass and occupies space

6. It is referred as accuracy in measurement

7. Term for a solid substance formed during a chemical reaction in a solution

9. Vernier scale use

10. Chemical reaction in which heat is released into the surroundings

Down

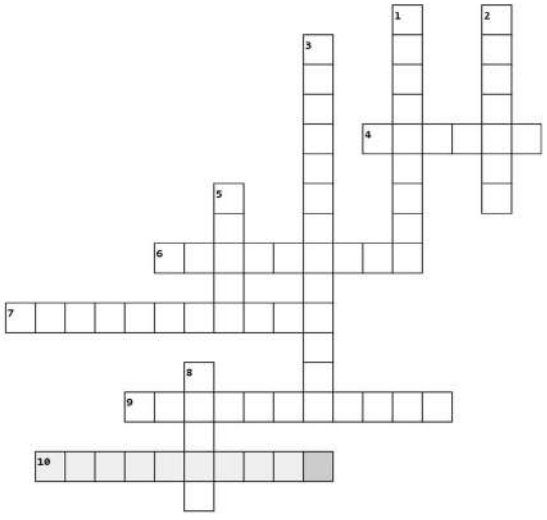
1. Reaction with loss of hydrogen

2. Substance in which a solute is dissolved to form a solution

3. Gas produced when metal reacts with hydrogen

5. A substance that remains chemically unchanged and does not readily react with other substances

8. Substances that can release hydroxide ions (OH-) when dissolved in water



5. Activity

Precipitation reaction - https://javalab.org/en/precipitation_reaction_en/
Neutralization reaction - https://javalab.org/en/neutralization_reaction_en/ For an interactive multimedia session for, use the given simulations.

WORKSHEET 2

1. Very short answer type questions

1. Differentiate between displacement and double displacement reactions with equations.
2. After eating a lot of chips and samosa, Rahul complained for acidity. His mother advised him to take milk of magnesia. How do we know that it'll be effective?
3. What changes occur when a chemical reaction takes place?
4. Does sunlight contribute to any chemical reaction? Give examples.
5. Write the balanced chemical reaction taking place in given figure.

2. Short answer type questions

1. Balance the given chemical equations

a) $Fe + H_2O \rightarrow Fe_3O_4 + H_2$

b) $Na + Cl_2 \rightarrow NaCl$

c) $Pb(NO_3)_2\ (s) \rightarrow PbO(s) + NO_2(g) + O_2(g)$

2.Suppose you have a solution of sodium chloride (table salt) and a solution of silver nitrate. Describe the sequence of events and the chemical reactions that occur when you mix these two solutions. Identify the precipitate that forms during this reaction.

3. Give examples of the following

a) Combination reactions

b) Decomposition reaction

c) Displacement reaction

4. Define catalysts with examples.
5. Why is a solution slaked lime used to perform white wash on the walls?

3. Long answer type questions

1. (i) Anisha realized that her bicycle that has been left neglected in the garage for a long time is unable to move smoothly and also has reddish brown debris falling off from its parts . What changes must've occurred ? Define with reactions

(ii) Emma had stored a batch of nuts in a container for a few weeks. When she opened the container, she noticed that the nuts had an unpleasant smell and a bitter taste. Explain what has caused nuts to become bad overtime? Use appropriate chemical reactions for explanation.

2. Write the balanced chemical equation for following

a) Ethene burnt in the presence of oxygen

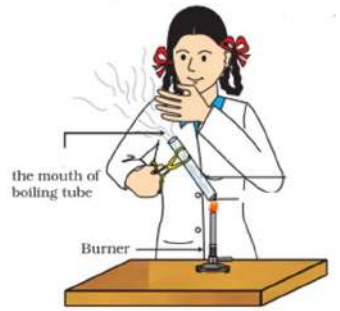
b) Nitrogen is treated with hydrogen gas
c) Decomposition of calcium carbonate from heat
d) Sodium sulphate is reacted with barium chloride
e) Ethanol is warmed with ethanoic acid.

3. What process is taking place in the given figure? Discuss the occurrence of this process in our daily lives.

4. On mixing solution of lead (II) nitrate and potassium iodide, what type of reaction occurs? Is there formation of precipitate? If so, what is it colour? Write the reaction.
5. What is electrolysis? Explain electrolysis of water with the help of a complete chemical equation.

4. HOTS

1. Why is there a need to balance chemical equations? Why are only moles balanced during reaction but not other entities?
2. Observe the given figure of a student carrying out a decomposition reaction. Discuss the safety measures taken by the student in the process and why are those important?



3. Often exothermic reactions produce unnoticeable amount of heat, like turning of vapour into snowflake or even chemical weathering of rocks. Discuss why the heat produced by these reactions are so little. Also discuss the reaction in which the produced heat is put to use.

Chapter 2 ACID, BASES AND SALT

WORKSHEET 1

1. Multiple choice questions.

1. During an experiment Ram was asked to find out the nature of an unknown substance which was marked weak base. Which of the following properties were not being shown by the substance?

a) Soapy touch
b) Bitter taste
c) Turn red litmus paper blue
d) Give OH^- ions in water

2. What is the chemical name of baking soda?

a) Sodium chloride
b) Sodium bicarbonate
c) Sodium carbonate
d) Calcium carbonate

3. While organizing the chemical cabinet in chemistry lab according to their pH, which of the following substance will be placed on the beginning of the pH marked shelf?

a) Lemon juice
b) Vinegar
c) Hydrochloric acid
d) Milk

4. Number of water of crystallization in Plaster of Paris

a) Two
b) Seven
c) Half
d) Ten

5. What is the byproduct of preparation reaction of baking soda?

a) Sodium carbonate
b) Ammonium chloride
c) Ammonium hydride
d) Sodium bicarbonate

2. State true or false.

1. When acid reacts with metal oxide, salt and water is formed.
2. Hydrogen chloride gas turns blue litmus red.
3. Baking soda on strong heating gives sodium oxide and carbon dioxide.
4. Farmers reduce the acidity of the soil by adding slaked lime.
5. All alkali base but all bases are not alkali.

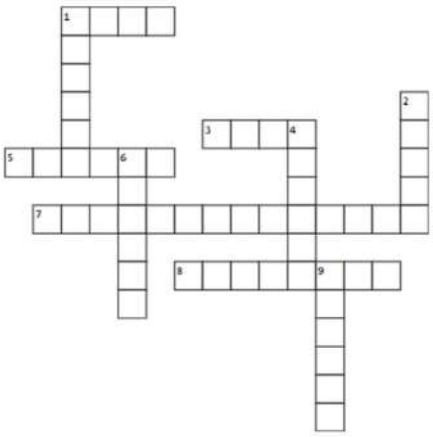
3. Fill in the blanks.

1. Anhydrous sodium carbonate is commonly known as_____
2. Litmus is _____ coloured pigment extracted from _____.
3. Living beings carry out their metabolic activities with an optimal pH range.

4. Nettle leaf have _____.
5. Water of crystallization is _____ molecules present in formula unit of salt.

4. Correct the given sentences.
1. Baking soda is used to make drinking water free from germs.
2. Ant sting contains acetic acid.
3. Salts of strong acids and weak bases have neutral pH.
4. CO_2 gas evolves with a fizz sound when metals react with acid.
5. A solution of tamarind tastes spicy.

5. Crossword
Across
1. Colour of phenolphthalein
3. Dandi march was aimed at production if this
5. A product of chlor-alkali process
7. Reaction of acid and base
8. Gas evolved during the reaction of metals with acids
Down
1. Colour of litmus solution
2. pH of water
4. Contains oxalic acid
6. Acid in lemon
9. Common name of $CaSO_4.2H_2O$



7. Activity
1. pH rainbow
In this group activity, students work in group of 5 to explore pH of different substances around them using suitable indicators and create a pH indicator rainbow. They test household substances to determine their acidity or basicity based on indicator colors. This hands-on exercise encourages teamwork and reinforces the concept of pH in an interactive way.

2. To understand the strength of acids and bases following videos can be used
(video by TED-Ed) https://youtu.be/DupXDD87oHc
(video b yCognito) https://youtu.be/_gYBbzkqrmE

WORKSHEET 2

1. Very short answer type questions.

1. Name any two forms in which calcium carbonate is found in nature.
2. What is universal indicator?
3. What are alkali bases? Are they different from other bases?
4. Why are alcohols not considered acids despite of having hydrogen atom in them?
5. Many substances on reaction with specific substances like turmeric solution produce some characteristic smell. What are such substances called?

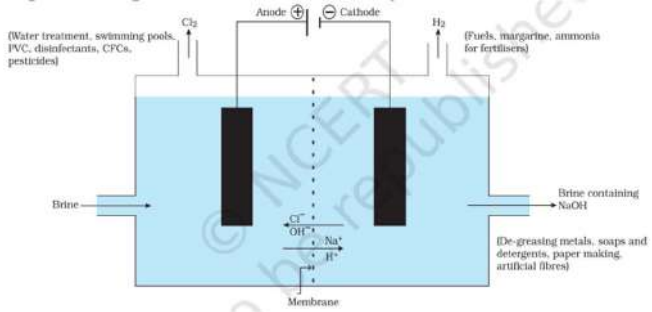
2. Short answer type questions.

1. What is a neutralization reaction? Give two examples with equation.
2. What is water of crystallization? How is it removed? Draw diagrams.
3. Take a look at the sign below. What does it state?

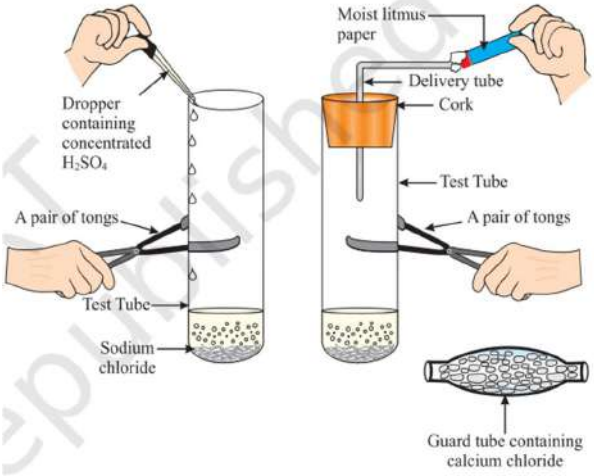
4. List the uses of
(i) Bleaching powder
(ii) Plaster of Paris
(iii) Baking powder
5. Describe an activity with diagram to demonstrate the reaction of metal carbonates and metal bicarbonates with acids produces carbon dioxide. Write the equations of all the reactions that take place.

3. **Long answer type questions**

1. Explain the following chemical properties of acids with the help of balanced chemical equations.
(i) When an acid reacts with a metal carbonate.
(ii)When an acid reacts with a metal bicarbonate.
(iii) When an acid reacts with a metal oxide.
2. (i)How does common salt play an important role as raw material in manufacturing of chemicals? Write equations to justify your answers.
(ii) Do salts always have a neutral pH? How are their pH determined?
3. Observe the given figure. What process is shown in the figure. Discuss the important products obtained by it and their uses.



4. The water supply company in a locality treats drinking water to make it safe for consumption. They use a process known as water chlorination, where chlorine gas (Cl_2) is bubbled into the water. This process is essential for disinfecting the water and killing harmful microorganisms.
Explain why chlorine gas is used in water treatment and how it helps make the water safe to drink.
What is the role of chlorine gas in terms of acidity or alkalinity (pH) when added to water?
If the pH of the water after chlorination is found to be highly acidic, what safety concerns might arise, and how can this issue be addressed?
5. Observe the given figure and answer the following questions



(i) What is being produced in this experiment?
(ii)Why has the litmus paper been moisturized in the experiment?
(iii) Why is the conc.H_2SO_4 being dropped into the test tube drop by drop?
(iv) Why and when is the guard tube containing calcium chloride used?
(v) What property of hydrogen ions are discovered through this experiment?

3. HOTS

1. Copper materials are not good to store curd. Explain.
2. In a hypothetical scenario, you are tasked with finding an environmentally friendly way to neutralize the acidic wastewater from an industrial plant before it is released into a nearby river. Discuss the possible methods you would consider for neutralizing the acidic wastewater and the advantages and disadvantages of each method. What factors would you take into account in making your final recommendation?
3. Farmers are often advised to send sample of soils in laboratories for testing. The sample is analyzed by the researchers and farmers are advised accordingly. How can farmers themselves use the concept of pH to determine if the soil is acidic or alkaline and what measures can they can take to balance the pH for better crop growth. Do you think this practice is necessary for good production?

Chapter 3 METALS AND NON METALS

WORKSHEET 1

1. Multiple choice questions

1. Pure gold is
a) 24 carat
b) 22 carat
c) 17 carat
d) 28 carat

2. Which of the following non-metals is essential for plant growth and is often used in fertilizers?
a) Oxygen
b) Hydrogen
c) Carbon
d) Nitrogen

3. What property of the metal is used to make wires?
a) Malleable
b) Poor conductors of heat
c) Malleable and ductile
d) Low density

4. Rani realized that despite of having so many iron products around, not many of them had rust. What processes must all those products must have undergone to stay safe from rust?
a) Tarnishing
b) Corrosion
c) Galvanization
d) Oxidation

5. Which metal is commonly extracted from its ore by the process of roasting followed by reduction with carbon?
a) Aluminum
b) Copper
c) Iron
d) Gold

2. State whether the following statement is true or false

1. Rusting of iron cannot occur in distilled water.
2. Calcination is carried out in the presence of oxygen.
3. Roasting converts sulphide oxide to ore.
4. Copper comes before Mg in reactivity series.
5. Non metals displace hydrogen from dilute acids.

3. **Fill in the blanks**

1. Aqua regia consist of ___:___ of hydrochloric acid and concentrated nitric acid.
2. An alloy is a _____ mixture of two or more metals.
3. Non metal oxides are either _____ or _____.
4. The extraction of metals from their ore and refining them for use is known as _____.
5. Ores are usually contaminated with large amount of impurities such as soil, sand etc. called _____.

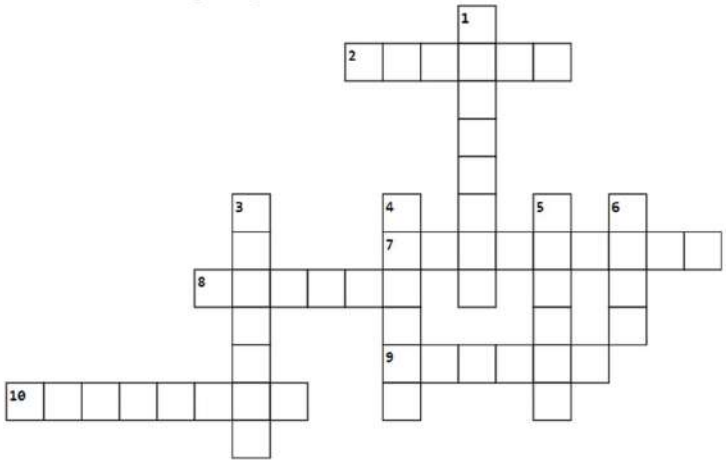
4. Crossword

Across

2. Metal preserved in kerosene
7. Metal most abundant in earth's crust
8. Used in wires due to low resistivity
9. Gas required for combustion
10. Non metal used for disinfecting water

Down

1. Light weight metals used in building spaceships
3. Liquid at room temperature
4. Non metal vital to all living organisms
5. Metal which is best conductor of heat
6. Metal forming amphoteric oxide



5. Activity

1. The students can be helped to understand the reactivity series by the help of given simulations- https://javalab.org/en/activity_series_of_metals_en/
2. The process of galvanization is used as often as the metal Fe itself. The process of galvanization can be understood better by this simulation - https://youtu.be/MLjePHzicJw

WORKSHEET 2

1. Very short answer type questions

1. Match the following

Steps involved in extraction	Metal ore
Electrolysis of molten ore	Sulphide ore
Calcination	Highly reactive metal
Roasting	Carbonate ore

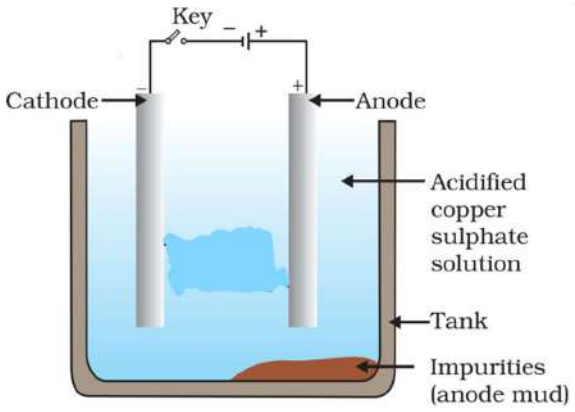
2. Define:
(i) Galvanization
(ii) Mineral
(iii) Gangue

Define malleability, ductility and sonorous. How are these properties used in daily lives?

3. Why are the handles of sauce pan and cooking spatulas made of non metals?
4. Illustrate the formation of ionic compounds with the help of suitable examples.

2. Short answer type questions

1. Give reasons why:
i) Silver articles become black over time
ii) Hydrogen is not evolved when metal reacts with nitric acid.
iii) Calcium floats when reacted with water.
2. Write an experiment to show that Mg is more reactive than Zn.
Compare the properties of a metal and a non-metal on the basis of the following:
(i) Nature of the oxide formed by them. (ii) Conductivity (iii) Physical properties
3. Write an experiment to show that that sulfur burns in air to form an acidic nature compound. Write equation and draw diagram.
4. Observe the refinig process in the given figure and answer the following questions.



(i) For what elements is this process used?
(ii) Once the key is closed, what will be the direction of electricity?

(iii) On what properties of metal is this process based?
(iv) Write composition of anode and cathode.
(v) What is the composition of anode mud in this process?
5. Rina bought a silver chain because she had studied in science that silver does not combine with oxygen like iron so she thought that it'll remain shining. But after some time her chain started to tarnish. Why did her chain tarnish?

3. Long answer type questions
1. Give reasons why
(a) Reactivity of Al decreases if it is dipped in HNO_3.
(b) Oxides of Na or Mg cannot be reduced by carbon.
(c) NaCl conducts electricity in aqueous as well as in molten state but not in solid state.
(d) Iron articles are covered with varnish.
(e) Metal like Na, K, Ca, N, Mg are never found in their free state in nature.

2. Distinguish between the processes of 'roasting' and 'calcination'. Which process is used for sulphide ore? Why aren't any of these processes suitable for metals with high reactivity?
3. Many people use aluminum foil in their kitchens for various purposes, such as wrapping food, covering dishes, and even cooking. Explain the following:
(i) Why is aluminum foil a preferred choice for cooking and food storage in kitchens?
(ii) Describe one specific chemical property of aluminum that makes it suitable for use with acidic foods.
(iii) Can you think of an example where the physical properties of aluminum foil play a crucial role in a common kitchen task?
4. What is the process involved in obtaining pure metal form impure metal? If we have to refine copper using this process, then explain the process of purification. What materials are used as anode, cathode and electrolyte. Draw diagram and write equations.
5. (i)Why are Carbonate and Sulphide ores are usually converted into oxides during the process of extraction of metals?
(ii)Hydrogen is not a metal, but it has been assigned a place in the reactivity series of metals.
(iii)The galvanized iron articles is protected against rusting even if the zinc layer is broken.

6. HOTS
1. The extraction of metals from their ores involves various chemical and physical processes. Discuss the environmental impact of the extraction of metals from their ores, including the challenges of managing the waste generated during the extraction process. Also discuss the occupational hazards associated with the metallurgy industry.
2. Gold is called a 'noble metal'. Known for its resistance to corrosion and tarnishing it's the most admired and costly metal. Discuss the historical and contemporary uses of gold, including its significance in jewelry, currency, and electronics.
3. Once sitting on the window seat in a train while travelling to her ancestral home, Anita notices that the train tracks have a little spacing in them. Each of the

lines track appeared to be made of iron and had little spacing every few meters. Why do think those gaps are made?

Chapter 4 CARBON AND ITS COMPOUNDS

WORKSHEET 1

1. Multiple choice questions

1. Number of isomers for C_6H_{14} are
a) 3
b) 6
c) 5
d) 7

2. While carrying out an addition reaction, which of the following catalysts should Mina be using if the process is being carried out for unsaturated hydrocarbons
a) Hydrogen
b) Palladium
c) Nickle
d) All

3. Mina has been asked by her teacher to list down requirements for substitution reactions. Which of the following is in her list
a) High temperature
b) High pressure
c) Sunlight
d) Nickle catalyst

4. The reaction of hydrogen carbonates with ethanoic acid yields
a) Salt
b) Carbon dioxide
c) Water
d) All

5. Identify the carbon compound lacking the ability of catenation
a) Acetone
b) Propene
c) Methane
d) Benzene

2. State weather the following statements are true or false

1. The conversion of ethanoic acid into ethaol is an oxodising reaction.
2. Flame is only produced when gaseous substances burn.
3. Saturated hydrocarbons fairly reactive.
4. Esters are formed by the reaction of esters with ethanol.
5. Soaps are usually used to make products for cleaning and shampoos.

3. Fill in the blanks

1. 100% pure ethyl alcohol is called _____
2. Heating ethanol with _____ yields unsaturated hydrocarbons.

3. The ionic end of soap dissolves in _____ while the carbon end of soap dissolves in _____.
4. _____ is formed by the reaction of soap from calcium and magnesium salts as a result of _____ of water.
5. Carbon and its compounds are some of the major sources of _____.

4. **Match the following**

Functional group	Prefix/ siffix
Ketone	ol
Triple bond	al
Carboxylic acid	yne
Alcohol	oic acid
Aldehyde	one

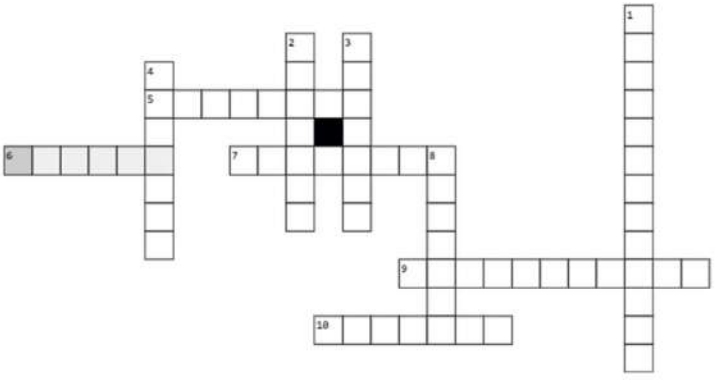
5. Crosswords

Across

5. Hydrocarbons having closed ring structure like Benzene
6. The term for a hydrocarbon with a double bond between two carbon atoms?
7. Electricity conducting allotrope of carbon
9. Carbon giving yellow flames and lot of smoke
10. An amphiphilic molecule formed by the activity of soap

Down

1. Process of adding hydrogen to unsaturated hydrocarbon to make it saturated
2. Simplest hydrocarbon containing only hydrogen and carbon
3. Organic compound with hydroxyl (-OH) group
4. Combining capacity of atom
8. Organic compound used as used as fuel in carbon lamp and industrial solvent



6. Activity

"Comparative Combustion of Carbon-Containing Compounds"

Objective: To observe and compare the combustion of different carbon-containing compounds found in our surroundings.
Materials required: Bunsen burner, Safety goggles and lab coats
Compounds for combustion (choose from options like paper, wood, wax, sugar, and ethanol), Metal or ceramic dishes or trays, Matches or a lighter, A stopwatch or timer

Procedure:

- Place each compound in a separate metal or ceramic dish or tray.
- One by one, ignite each compound using matches or a lighter and observe how they burn.
- Start with the compounds that contain carbon (e.g., paper, wood, wax, sugar) and then move on to ethanol, which is a carbon compound but in liquid form.
- Note the color and intensity of the flame, the production of smoke or soot, and the duration of combustion.
- Use a stopwatch or timer to measure the time it takes for each compound to burn completely.

a) Present the selected compounds (paper, wood, wax, sugar, and ethanol) to the students and discuss which ones contain carbon and which do not.
b) Discuss the observations with the students. Encourage them to describe the differences they observed in the burning process of each compound.
c) Highlight the role of carbon in the combustion process and how it affects flame characteristics and residue (e.g., soot).
d) Discuss the environmental implications of burning different carbon-containing materials.
Note- due to the safety hazard, the activity is to be performed by the teacher in the classroom with appropriate safety measure (such as wearing safety goggles, tying back hair, and working in a well-ventilated area) and pupil are to be encouraged to participate in observations and noting it down.

WORKSHEET 2

1. Very short answer type questions

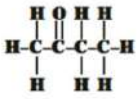
1. What is catenation?
2. List down two properties of ethanol.
3. Why does carbon form a covalent bond?
4. Define addition reaction with suitable example.
5. What is saponification reaction?

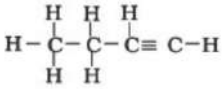
2. Short answer type questions

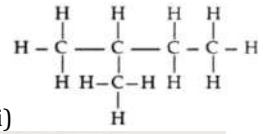
1. What are isomers? Explain with examples.
2. Devise an experiment to distinguish between the alcohol and carboxylic acid experimentally.
3. Draw the electron dot structure of a)ethane b)ethene c)ethyne
4. Describe the dome shaped allotrope of carbon.
5. Describe the general formula of alkane, alkene and alkyne. Draw the structure of first members of each series.

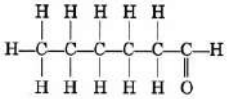
3. Long answer type questions

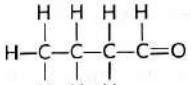
1. What are the properties of carbon responsible for its versatility in forming compounds? Explain.
2. Baking soda (sodium hydrogen carbonate) is often used in baking, and vinegar (which contains ethanoic acid) is a common ingredient in cooking and cleaning. Describe the chemical reaction that occurs when baking soda and vinegar are combined. How is this reaction used in everyday applications, such as making fluffy pancakes or cleaning household surfaces?
3. How does ethanoic acid react with carbonates and hydrogen carbonates? Explain with equations.
4. Differentiate between saturated and unsaturated hydrocarbons. Give one example for each. Explain why carbon is called "friendly" element? Draw the structures of two isomers of butane.
5. Name the given compounds.

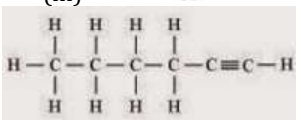
(i) 

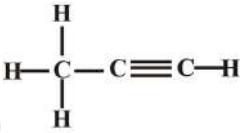
(ii) 

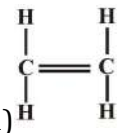
(iii) 

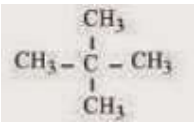
(iv) 

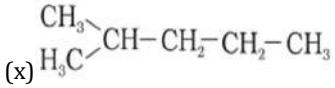
(v) 

(vi) 

(vii) 

(viii) 

(ix) 

(x) 

4. HOTS

1. Calcium carbonate ($CaCO_3$) is a common carbonate compound found in limestone and marble. When heated, it decomposes to produce calcium oxide (CaO) and carbon dioxide (CO_2) gas.

a) Write the balanced chemical equation for the thermal decomposition of calcium carbonate.

b) Calculate the molar mass of calcium carbonate ($CaCO_3$).

c) If you start with 100 grams of calcium carbonate, calculate the mass of calcium oxide (CaO) produced when it undergoes thermal decomposition

2. Organic compound P is used as preservative in pickles and has a molecular formula $C_2H_2O_2$. this now forms a sweet smelling compound on reaction with ethanol. Identify compound P. Write the chemical reaction of the process mentioned.

3. Carbon is a fundamental element present in diverse forms around us, including in our own bodies and the food we consume. Discuss the role of carbon in the structure of organic molecules in our body and its significance in the nutritional value of food.

Chapter 5 LIFE PROCESSES

WORKSHEET 1

1. Multiple choice questions

1. Where does most of the absorption of nutrients take place in the human digestive system?
a) Stomach
b) Small intestine
c) Liver
d) Large intestine

2. In humans, which enzyme is responsible for the digestion of fats into fatty acids and glycerol?
a) Amylase
b) Pepsin
c) Trypsin
d) Lipase

3. What is the primary purpose of respiration in both plants and animals?
a) To produce glucose
b) To release energy from food
c) To absorb nutrients from the environment
d) To remove excess water

4. During anaerobic respiration in animals, what is the end product when glucose is partially broken down without oxygen?
a) Ethanol
b) Lactic acid
c) Carbon dioxide
d) Water

5. Which organ stores bile and releases it into the small intestine to aid in fat digestion?
a) Liver
b) Stomach
c) Pancreas
d) Gallbladder

2. State whether the following statements are true or false

1. The blue patches on green leaves on introduction of starch shows presence of salts.
2. Phloem transports minerals in plant.
3. Plants releases excess oxygen in the atmosphere.
4. Virus show molecular movement when they're freely living.
5. Alveoli and capillaries both have very thin walls.

3. Fill in the blanks

1. Energy requirements of hetero trophic organisms in fulfilled by _____.
2. Amoebas use structure called _____ for nutrition.

3. The stomatal opening is surrounded by _____ cells.
4. Blood pressure is measured using _____.
5. The urinary bladder in _____ hence under nervous control.

4. Correct the given sentences.

1. Blood enters heart from lungs from left ventricle.
2. Red blood cells transport oxygen and carbon dioxide in our body.
3. Digestion of fats starts from small intestine by action of trypsin.
4. Breathing is primarily used for excretion of waste.
5. Transportation though xylem uses ATP.

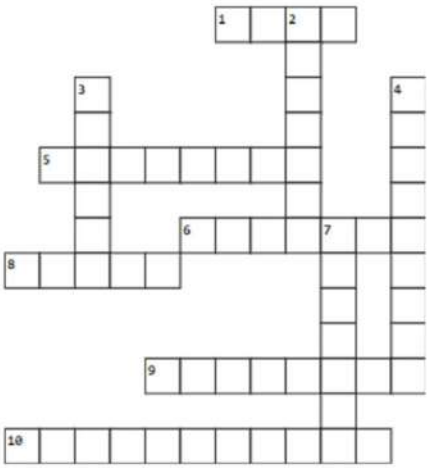
5. Crossword

Across

1. Main nitrogenous waste product of humans
5. Plant store energy in this form
6. Enzyme that starts digestion of food in mouth
8. Fluid other than blood involved in transportation
9. Filtration units in kidney
10. Pigment in red blood cell to carry oxygen

Down

2. Product of respiration in yeast
3. Food transporting unit in plants
4. Helps in blood clotting
7. Tiny air sacs in lungs



6. Activity

1. Take a white flower (eg. Carnations or daisies. Trim the stem to facilitate water absorption. Now in a beaker take water and mix food colour. Place the flowers in them. Place this setup in a well lit area but not directly under sun. After 5-10 minutes, the petals will slowly start changing colour.

(i)What phenomena is taking place here?

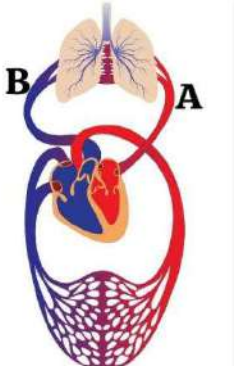
(ii)What tissues are involved in this phenomena?

(iii)Why is plant placed in well lit area but not directly under sun?

WORKSHEET 2

1. Very short answer type questions

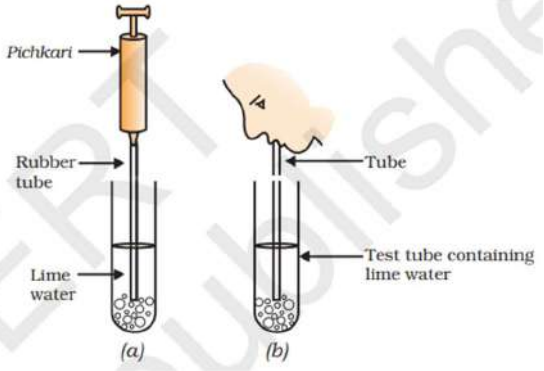
1. Differentiate between autotroph and heterotroph.
2. What are the different pathways for breakdown of glucose? (explain using flow chart)
3. Identify the structure B and A and mention their work.



4. What kind of walls does stomach have and how is it important in its functioning?
5. How is the osmotic pressure in phloem increased?

2. Short answer type questions

1. State the role of following in digestion
(i) villi in small intestine
(ii) Pancreatic enzyme
(iii) Bile juice
(iv) Amylase enzyme
2. What is the role of mucus in stomach? What would happen if our stomachs stop secreting mucus?
3. Why are the oxygenated and deoxygenated blood is kept separated by our heart? How is oxygenated and deoxygenated blood kept separated in human body.
4. Define the function of following structure
(i) Alveoli
(ii) Nephrons
5. Observe the given experiment setup and answer how does figure (a) in which air in being blown by pichkari different from (b) in which the air is being exhaled in to the lime water?



3. Long answer type questions

1. (i)What kind of nutrition takes place in green plants? What are the organelles and enzymes responsible for this? How will you check if the plants has made it 'food'?

(ii) What kind of nutrition occurs in amoeba? Illustrate the nutrition in amoeba.

2. How is transportation in plants different from that in animals? Define double circulation. What is the role of Lymph in human body?

3. How is the excreting in plants different from excretion in humans? Discuss the different methods employed by plants and animals for excretion with a neat labeled diagram of nephron.

5. How does involvement of oxygen changes different types of respiration? Discuss the economic uses of respiration performed by yeast.

4. HOTS

1. In recent years the incidence of diabetes among the teenagers has been observed. The type 2 diabetes in which the body does not produce enough insulin was once seen in old age only. Research shows that the change in lifestyle and obesity are the reason for so. What lifestyle habits could be promoting increased diabetes cases in teenagers? What changes in lifestyle do you think teenagers like yourself need to make in their lifestyle?

2. Where do you think the rate of transpiration in plants more? Deserts, forests or mountains? Give reasons.

3. In high-altitude regions, people often face challenges due to lower oxygen levels. How do the processes of respiration and transportation of oxygen in the human body change in high altitudes? Discuss.

Chapter 6 CONTROL AND COORDINATION

WORKSHEET 1

1. Multiple choice questions

1. The Male hormone among the following is
a) Pituitary
b) Insulin
c) Growth hormone
d) Testosterone

2. The action of adrenalin hormone results in
a) Flight
b) Heartbeat increases
c) Sweating
d) Active digestion

3. Gustatory receptors are concerned with
a) Touch
b) Smell
c) Taste
d) Sight

4. Cerebellum is not responsible for
a) Walking
b) Smelling
c) Skating
d) Picking a pencil

5. The elongation of root in plants is ____ phototropic and _____ geotrophic
a) Positive, positive
b) Negative, negative
c) Negative, positive
d) Positive, negative

2. State weather the following statements are true or false.

1. The hormone to regulate sugar level in the body is produced by insulin.
2. Reflex arcs are formed in brain which carry out reflex actions quickly.
3. Vomitting is controlled by pons in hind brain.
4. Dwarfism is caused by increased production of adrenalin hormone.
5. When bright light focus our eyes, the pupils reduce in size due to reflex action.

3. Fill in the blanks.

1. The nervous system uses ____ impulse to transmit information.
2. _____ mechanism regulates the action of the hormone.
3. The timing and the amount of the hormone are regulated by the _____ mechanism.
4. The plant hormone ccontrol _____ growth
5. _____ are the chemicals present in synapse which help to transmit signal.

4. Crossword

Across

2. Chemical messengers

5. The main thinking part of the brain

6. The junction between the two neurons

7. The gland responsible for growth hormone

8. Elongations of sell body of neuron

10. A detectable change in an organism's environment that triggers a response

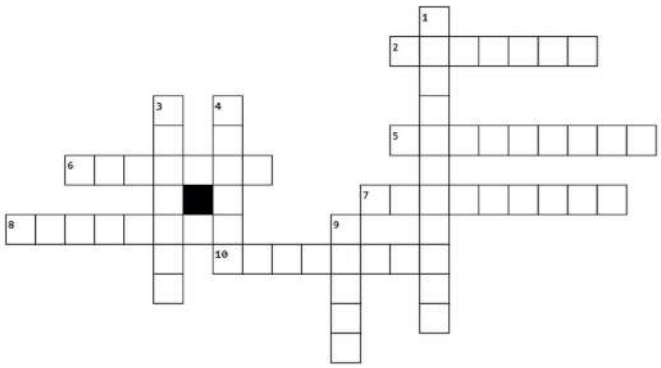
Down

1. The internal environment of the body

3. Bony box protecting brain

4. Endocrine gland present only in males

9. Plant hormone synthesize at the shoot tip



5. **Activity**

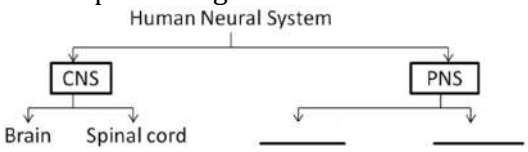
Teacher can demonstrate the reflex action in our body- Knee-jerk reflex and Pupil reflex. The demonstration of reflex action will help children observe the process closely. Discussion on why these reflexes are universal can follow (Remember how people often flash light into the eyes of people who suffer head injury).

Note- the demonstration should be carried out by the teacher or in supervision as even a little too much force on knee can damage patellar tendon.

WORKSHEET 2

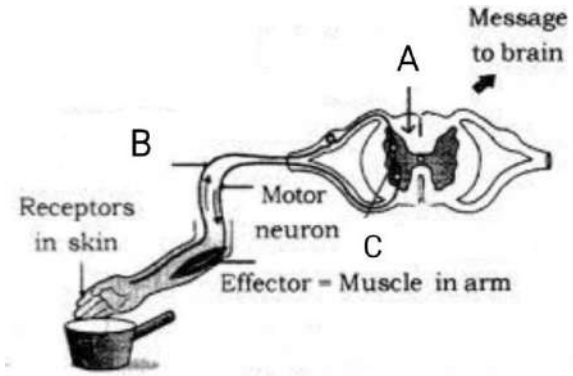
1. Very short answer type questions

1. Draw a labeled diagram of a cell of a tissue involved in transmitting signal in humans.
2. Why do endocrine glands put their hormone directly in blood?
3. Differentiate between Voluntary actions and reflex actions.
4. The wilting of leaves in plants is put to action due to which hormone?
5. Complete the given flow chart.



2. Short answer type question

1. Why do the plants tend to bend towards the open window when placed in the room?
2. Why is it advised to consume Iodized salt by the health professionals?
3. Label the parts named A,B and C in the following diagram. Also mention the phenomena shown in the diagram.



4. Mention one function of these hormones - Auxin, Absic acid, Cytokinin, Gibberlin, Testosterone, Insulin, Adrenalin
5. Trace down the similarities and differences between the neural and homonal control and coordination in our body.

3. Long answer type question

1. Draw a well labeled diagram of human brain. What is reflex action? Does brain have have role to play in reflex action?
2. What are hormones? List down the functions of hormones.
3. Why are Touch-me-not plants called so? Can this movement be classified into growth?
4. List down the voluntary and involuntary activities performed by different areas of the brain.
5. Describe how auxin is responsible for bending of plant towards the light. Explain how cytokinin and auxin both are responsible for plant growth.

4. HOTS

1. The signals transmit throughout our body quickly through neurons as the signal travel like an electrical impulse in the body. If neural connection systems in our body are so quick and dependable then why did the evolution grant us chemical coordination system through hormone? Is the functioning of body of an organism effective without hormone regulation?
2. A common myth made popular is that a human uses only 10% of their brain in their whole life. There's no scientific evidence backing up this myth but there definitely are magnetic radio imaging of brain stating otherwise. Discuss how this myth is false and what could've been the reasons for people to believe in this. (Hint: different parts of brain carry out different functions).
3. Plants lack a nervous system like animals, yet they exhibit coordinated responses to external stimuli. Even in the absence of a centralized nervous system, how do plants regulate their growth and development in response to environmental cues? Explain the various ways in which plants perceive their environment and coordinate responses. Provide examples of plant movements as evidence. (Hint- Discuss the role of hormones in plants.)

Chapter 7 HOW DO ORGANISMS REPRODUCE?

WORKSHEET 1

1. Multiple choice questions

1. Organisms that reproduces in similar ways as Spirogyra is :
(a) yeast
(b) hydra
(c) Planaria
(d) Sea anemone

2. Select the correct statement regarding surgical method of birth control.
(a) It involves termination of pregnancies in women particularly after eight weeks of conception
(b) Small portion of sperm duct in males is removed by surgical operation and both cut ends are ligated properly
(c) Small portion of oviducts in females is removed by surgical operation and cut ends are ligated
(d) Both (b) and ©

3. Fertilization is the process of
(a) transfer of male gamete to female gamete
(b) fusion of nuclei of male and female gamete
(c) adhesion of male and female reproductive organs
(d) the formation of gametes by a reproductive organ.

4. What is the primary objective of reproductive health education?
(a) Promoting abstinence from sexual activity
(b) Providing information about contraceptives
(c) Ensuring the birth of male children
(d) Promoting early marriages

5. What is the purpose of the prostate gland in the male reproductive system?
(a) To produce sperm
(b) To store sperm
(c) To produce testosterone
(d) To provide nutrients and protection for sperm

2. State whether the following statements are true or false

1. Gestation period typically in humans is of 9 to 10 months.
2. The production of sperm takes place in ovaries.
3. Diaphragms ares suitable contraceptives for male and females.
4. Placenta is disc embedded in the uterine wall.
5. Puberty occurs at once in all the individuals.

3. Fill in the blanks

1. In Bryophyllum where the buds are produced for vegetative propagation at _____.
2. _____ contraceptive method changes the hormonal balance of the body.
3. Regeneration is carried out by _____ cells.

4. The cells in tissue culture divide rapidly to form _____.
5. _____ provides passage for sperm into the male body from testes.

4. Correct the given sentences

1. Sexual reproduction involves new individual for creation of two individuals.
2. Copper T is usually taken as pill.
3. For unicellular organisms fission creates many organisms.
4. In females the number of eggs grow as they mature.
5. Spirogayra bursts when mature to liberate spores.

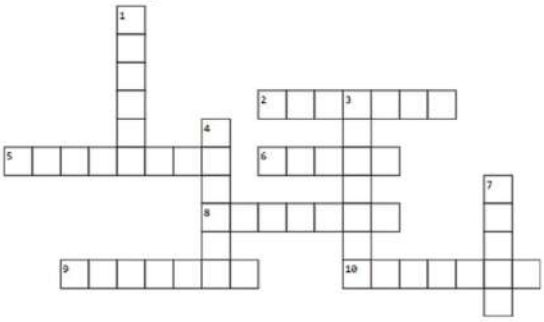
5. Crossword

Across

2. Reproduction method used by bacteria and amoeba
5. Special tissue for nourishing foetus in womb
6. Uses budding to reproduce
8. Period during adolescence
9. Future shoot
10. Cell division responsible for production of gametes

Down

1. Cell formed by union of sperm and egg
3. Sac holding testes
4. Female reproductive part of flower
7. Matured ovary



6. Activity

1. Organize a debate on the pro and cons sexual and asexual reproduction. Encourage students to use scientific evidence and examples to support their arguments.
2. Attached to the link is an animated video of the story of fertilization - https://youtu.be/_5OvgQW6FG4
3. Attached is the link to the video discussing the artificial reproductive technologies. https://youtu.be/Y5dTyrg-Y4w
Discuss the implications of this methods in today's world.

WORKSHEET 2

1. Very short answer type questions

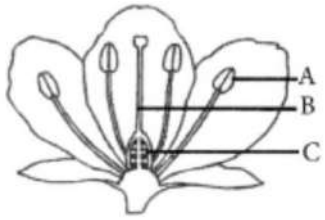
1. Name the causative agent of the disease "kala- azar" and its mode of reproduction
2. What are unisexual and bisexual flowers ? Give examples.
3. Give types and examples of asexual modes of reproduction.
4. Discuss the germination of seed with appropriate diagrams.
5. What factors determine the size of the population?

2. Short answer type questions

1. Differentiate between binary fission and multiple fission. Draw diagrams.
2. What happens when-

(i) Planaria gets cut into two pieces?
(ii) A mature Spirogyra filament attains considerable length?
(iii) a mature sporangia bursts

3. Observe the given diagram and answer- in which part of body does fertilization occur ? How does Male gamete reach female gamete ?



4. How does a sperm get nutrition in male body ? What happens after a sperm gets into the female body?
5. What changes occur in bodies of growing children to allow them to reproduce? Where are the testes located? Why are they present outside the body?

3. Long answer type questions

1. No two individuals are absolutely alike in a population with sexual mode of reproduction. Explain. How is the genetic information stored and passed on to next generation in humans?
2. How does the uterus in humans prepare for the anticipation of pregnancy? What happens when pregnancy does not occur? Draw a labeled diagram of female reproductive system.
3. Give reasons why

(i) Parents and progeny have the same number of chromosomes
(ii) Cyst formation occurs in some organisms
(iii) Cell by cell division does not occur in complex multicellular organisms
(iv)Fertilization cannot take place in plants without pollination
(v) Ther are often many young bryophyllum plants surrounding mature plant.

4. Trace down the pathway of sperm through a schematic diagram. Draw a labeled diagram of male reproductive organ.
5. Use well labeled diagram to explain different types of pollination. What are the different pollinating agents? What are limitation of sexual reproduction?

4. HOTS

1. How is vegetative propagation and asexual reproduction in plants used for economic benefit?
2. Plants raised by vegetative propagation bears flowers and fruits earlier than sexually produced plants. Why?
3. Are the methods used in females same as males? Discuss.

Chapter 9 HEREDITY

WORKSHEET 1

1. Multiple choice questions

1. Trait in an organism is influenced by
(a) Paternal DNA only
(b) Maternal DNA only
(c) Both maternal and paternal DNA
(d) Neither by paternal nor by maternal DNA

2. What plant was used by Gregor Mendel to conduct his studies?
(a) Pea plant
(b) *Pisum sativa*
(c) Both
(d) None

3. Which of the following scientists not had their contribution in study of heredity in genetics
(a) Haldane
(b) Darwin
(c) Mendel
(d) Young

4. What types of plants were seen in F1 progeny?
(a) Tall
(b) Medium
(c) Short
(d) More than one correct answers

5. Diversity is seen in
(a) Cross Pollination
(b) Sexual reproduction
(c) Asexual reproduction
(d) More than one correct answer

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

1. Due to heredity sons are exact copy of their father.
2. If few aves, temperature determines the sex of the offspring.
3. All human chromosomes have maternal and paternal copy.
4. The trait to roll tongue is an acquired trait.
5. Mendel for the very first time used his knowledge of maths and science to study genetics.

3. Fill in the blanks.

1. In species such as _____ individuals may change their sex.
2. The more characteristic species have in common the _____ they're related.
3. Variations arising during the process of reproduction can be _____.
4. Chromosome ____ determines boy and ____ determines girls.
5. Mendel's work on _____ was widely accepted and praised.

4. Correct the given sentences.

1. After fertilization the number of chromosomes reduces to half.
2. Once the tail of a mice is removed, its progeny will be tail-less due to heredity.
3. Progeny of F1 and F2 are same in Mendel's experiment.
4. Twins have identical DNA because they're formed together.
5. Mendel's discoveries about genetics were widely published and immediately recognized.

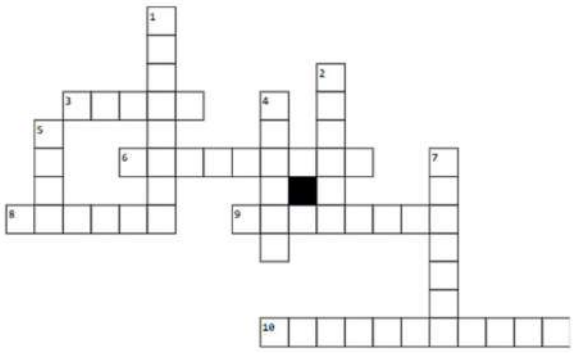
5. Crossword

Across

3. A specific characteristic or feature of an organism
6. Result due to sexual reproduction
8. Trait selected by Mendel
9. Study of inheritance
10. type reproduction in plant

Down

1. Trait that is expressed in more
2. Cell formed after fertilization
4. Gives X chromosomes to foetus
5. Part of DNA providing information for protein synthesis
7. Birth country of Mendel



6. Activity

- Family Traits Survey:

In this activity, students will create a survey to explore inherited traits within their families. The traits like eye color, hair type, and the ability to roll one's tongue. Students will then interview their family members to record these traits. After collecting data, students will compile it and engage in a discussion to identify and understand inheritance patterns observed within their families.

- To get an idea of evolution of life forms on earth, attached video can be used. The video aims at giving an idea of evolution from the appearance of very first organisms to us. (Video by ASAP Science) https://www.youtube.com/watch?v=H2_6cqa2cP4

WORKSHEET 2

1. Very short answer type questions.

1. Differentiate between inherited traits and acquired traits.
2. Why is the progeny always tall when a tall pea plant is crossed with a short pea plant?
3. How is the information of genetics stored?
4. A blue colour flower plant denoted by BB is cross-bred with that of white colour flower plant denoted by bb. State the colour of flower you would expect in their F1 generation plants.
5. What are 'germ cells'?

2. Short answer type questions.

1. What is the difference between inherited traits and acquired traits. Give examples.
2. What is gene? How does it help in inheritance? (hint- expression of gene)
3. How do we know that human chromosomes are paired?
4. A cross was made between pure breeding pea plants, one with round and green seeds and the other with wrinkled and yellow seeds. Write the different types of F2 progeny obtained along with their ratio when F1 progeny was selfed.
5. Differentiate between dominant and recessive traits.

3. Long answer type questions.

1. Give reasons why-
(i)No two individuals are absolutely alike in a population.
(ii)Fathers are responsible for sex of a child.
2. Discuss how the traits get expressed in Mendel's cross with the pea plant.
3. Discuss the given findings of Mendel and name the plants he worked with.
(i) Law of dominance.
(ii) Inheritance of two separate characters
4. In pea plants, yellow round seeds (YR) are dominant over green wrinkled seeds (yr). A plant that is heterozygous for both traits is crossed with a plant that is homozygous recessive for both traits.
(i) Determine the progeny in F1 generation and F2 generation.
(ii) Draw a grid to show genetic makeup of all the progeny.
5. The trait of curly hairs in humans is a dominant trait as compared to straight hair. But increased population of straight haired people might suggest otherwise. Design a hypothetical experiment to prove that curly hairs are dominant trait.

4. HOTS

1. What are modern day humans called? Have different 'races' of humans evolved differently? Give reasons for your answer.
2. How does the information stored in DNA plays its part in evolution? Discuss.
3. 'Evolution cannot be equated with progress'. Discuss.

Chapter 9 LIGHT REFLECTION AND REFRACTION

WORKSHEET 1

1. Multiple choice questions

1. A concave mirror gives real, inverted and same size image if the object is placed
a) At F
b) At infinity
c) At C
d) Beyond C

2. Power of the lens is -20 D, its focal length is
a) 2m
b) -40m
c) 0.05m
d) -25m

3. Convex lens focus a real, point sized image at focus, the object is placed
a) At focus
b) Between F and 2F
c) At infinity
d) At 2F

4. An object at a distance of + 10 cm is slowly moved towards the pole of a convex mirror. The image will get
(a) shortened and real
(b) enlarged and real
(c) enlarge and virtual
(d) diminished and virtual

5. Which of the following mirror is used by a dentist to examine a small cavity?
(a) Convex mirror
(b) Plane mirror
(c) Concave mirror
(d) Combination of convex and concave mirror

2. State whether the following statements are true or false

1. Convex lenses are used as magnifying glasses to enlarge small objects or text for reading.
2. The magnification by a plain mirror is 0.
3. Convex lenses are used in stores and parking lots for security and surveillance purposes
4. A concave mirror focuses parallel rays of light to a single point.
5. A concave mirror may magnify or reduce the size of objects depending on their distance

3. Fill in the blanks.

1. Mirrors in _____ allow submarines and other vehicles to observe objects above water while remaining submerged.

2. The object placed at infinity in concave mirror forms image at _____.
3. The refractive index of oil is _____ than water.
4. In convex mirror diminished image if formed when object is placed at _____.
5. Concave mirror only form real and erect image when object is at _____.

4. Correct the given sentences.

1. The radius of curvature of a mirror is 20cm the focal length is 2m.
2. The angle of incidence for a ray of light having zero reflection angle is 180^{o}.
3. Biconvex type of lens is used to disperse white light into its constituent colors.
4. A lens of focal length 5 cm forms an erect image, three times the size of the object. The distance between the object and image is 15cm.
5. When white light passes through a prism, maximum deviation will be of yellow colour.

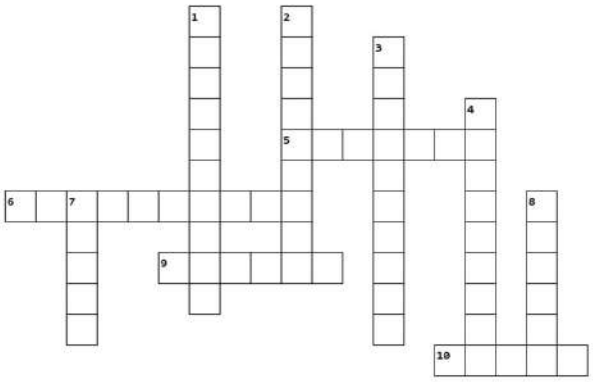
5. Crossword

Across

5. SI unit of power of lens
6. Bending of light
9. Lens is thicker at the centre
10. Law of refraction is called as _____'s law

Down

1. Term for the bouncing back of light when it strikes a surface
2. The point where the incident ray strikes a reflecting or refracting surface
3. Phenomenon where light is separated into its constituent colors
4. The change in direction of light as it passes from one medium to another
7. The point where light rays meet or appear to diverge
8. A line perpendicular to a reflecting or refracting surface



6. Activity

Divide the class into group of 5 students each. Give each group some materials, and give them about ten minutes to see what happens to light while using them. While exploring, ask students to write down observations and share them with their teammates. Once done exploring, students can begin to label their

observations by learning the meanings of refraction, and reflection.
Materials given-
Flashlight (a laser pointer is a great choice but you must go over safety expectations)
A clear glass of water
Magnifying glass
Tissue paper
A piece of paper with a target on it
A concave and a convex lens
A clear piece of coloured glass

WORKSHEET 2

1. Very short answer type questions

1. What is meant by power of a lens? Name and define its S.I. unit.
2. Mention the types of mirrors used and justify your response
(i) rear view mirrors
(ii) shaving mirrors
1. State Snell's law for refraction of light and also express it mathematically.

3. Find the power of a convex lens which forms a real and inverted image of magnification -1 of an object placed at a distance of 20 cm from its optical centre.
4. An object is placed at a distance of 30 cm in front of a convex mirror of focal length 15 cm. Write four characteristics of the image formed by the mirror.

2. Short answer type questions

1. Khushi when placed a glass slab in an unknown liquid, she notices that it has become invisible and believes magic to be involved. Give scientific explanation for the phenomena observed by Khushi.
2. Define the following terms in the context of spherical mirrors:
(i) Pole
(ii) Centre of curvature
(iii) Principal focus
Calculate the magnification of the image of an object placed perpendicular to the principal axis of a concave mirror of focal length 15 cm. The object is at a distance of 30 cm from the mirror.
3. The refractive indices of water and glass with respect to air are 4/3 and 3/2 respectively. If the speed of light in glass is 3×10^8 m s-1, find the speed of light in water.
4. What is understood by lateral displacement of light? Illustrate it with the help of a diagram. List any two factors on which the lateral displacement in a particular substance depends.
5. Draw ray diagram to show the path of the refracted ray in each of the following cases. A ray of light incident on a concave lens
(i) is parallel to its principal axis, (ii) is passing through its optical centre

3. Long answer type questions

1. A spherical mirror produces an image of magnification -3 on a screen placed at a distance of 60 cm from the mirror.
(i) Write the type of mirror.
(ii) Calculate the focal length of the mirror.
(iii) Draw the ray diagram to show the image formation in this case.

2. Calculate the power of combination of a convex lens of focal length 25 cm and a concave lens of focal length 20 cm are placed in close contact with each other.

3. List the sign conventions that are followed in case of refraction of light through spherical lenses using ray diagram.

4. An object placed at 30cm in front of concave mirror of focal length 15cm. The length of the object is 2cm. At what distance of the mirror the screen be placed to obtain a sharp image?
5. Draw a ray diagram to show the use of a convex lens for the formation of images having the following characteristics.
(a) Real & inverted and diminished
(b) Virtual, erect & magnified.

6. HOTS

1. In the field of medical imaging, elaborate on how both mirrors and lenses are employed. Discuss the role of mirrors in endoscopes and the use of lenses in techniques like MRI, CT scans, and ultrasound imaging. Highlight the benefits of these optical components in healthcare.
2. Consider a double-convex lens. Explain how the focal length and image characteristics (real, virtual, magnified, diminished) change as the object is moved closer to the lens. Use ray diagrams to support your explanation.
3. In photography, the choice of lenses and their properties significantly impact the quality and composition of photographs. Discuss how different types of lenses (convex, concave, and combination lenses) are used in photography and their effects on image formation.

Chapter 10 THE HUMAN EYE AND THE COLOURFUL WORLD

WORKSHEET 1

1. Multiple choice questions

1. The far point and near point of a human eye are respectively
a) 25cm, 50cm
b) infinity, 25cm
c) 25cm, infinity

2. The light seems to change direction by bending when it travels from a
a) Cleaner to Denser medium
b) Rarer to Cleaner medium
c) Rarer to Denser medium
d) Denser to denser medium

3. Who was the first person to use glass prism to obtain light spectrum?
a) Newton
b) Young
c) Orested
d) Faraday

4. Which part of the eye gives it its color ?
a) Retina
b) Sclera
c) Cornea
d) Iris

5. What is the function of the retina in the human eye?
a) To control the size of the pupil
b) To focus incoming light
c) To detect and convert light into electrical signals
d) To produce tears for lubrication

2. State whether the following statements are true of false

1. The angle of incidence is always equal to the angle of reflection in the process of refraction
2. The lens of the human eye is fixed in shape and cannot change its focal length.
3. The refractive index of cold air is slightly more than hot air.
4. The light ray travel parallel to base inside prism.
5. Presbiopia is a refractive defect.

3. Fill in the blanks.

1. _____ happens due to gradual weakening of ciliary muscles and diminishing flexibility of eye lens due to ageing.
2. The time difference between the actual sunset and the apparent sunset is about _____ minutes.
3. The splitting of white light into components is called _____.
4. The _____ is the part of the eye responsible for focusing light on the retina.
5. The colour of scattering light depend on _____ of particle.

4. Correct the given sentences

1. The human eye can perceive colors because of the presence of only rods in the retina.
2. A concave lens can be used to correct nearsightedness.
3. Rod and cone cells are photosensitive cells present on cornea.
4. Iris is light muscular diaphragm that controls the pupil size.
5. Crystalline lens of people at old age get dark.

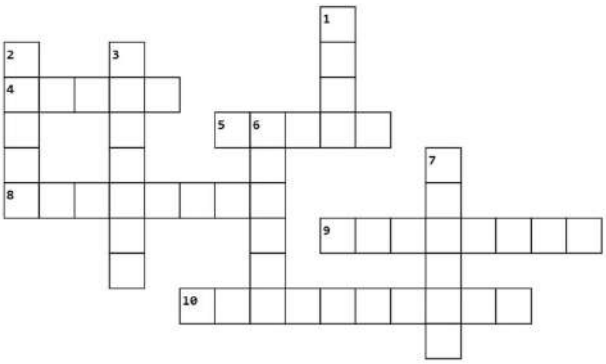
5. Crossword

Across

4. Black circular opening in the center of the eye called
5. Causes light to scatter
8. Clouding of the eye's natural lens called
9. Shape of a converging lens
10. Redirection of light in all directions when it encounters small particles

Down

1. Part of the eye that focuses light onto the retina
2. Nerve carrying visual information from the retina to the brain
3. Muscles responsible for changing the shape of the eye's lens
6. Light-sensitive layer at the back of the eye called
7. Medical term for nearsightedness



7. Activity

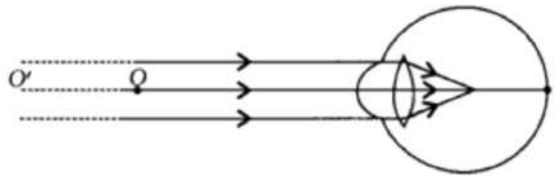
https://www.youtube.com/watch?v=malQyromQfI

Attached is the link to the 90s eye donation campaign. Discuss on the importance of such campaign. Why do you think celebrities promote it too?

WORKSHEET 2

1. Very short answer type questions

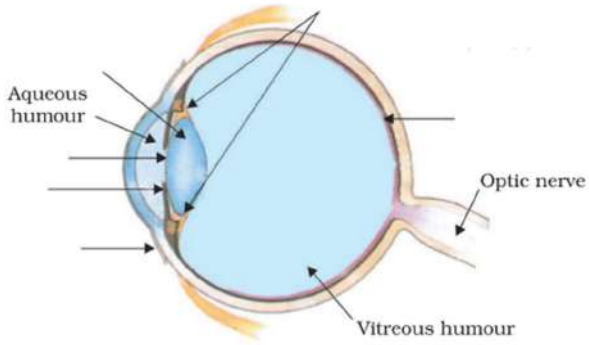
1. What condition is shown in the given figure. What type of lens is required for correction of this vision?



2. Define power of accommodation
3. Why does the sky appear blue?
4. Why do elderly use spectacles more than young poeple?
5. Often old people have a whitish layer on their eye. What is the reason behind that?

2. Short answer type questions

1. Label the listed parts in given diagram of human eye and explain the functions of each of the following parts.



(i) Cornea (ii) Iris (iii) Crystalline lens (iv) Ciliary muscles (v) pupil (vi) retina

2. Draw ray diagrams showing (i) a hypermetropic eye and (ii) its correction using suitable optical device.
3. Anita needs new spectacles which require lens of power +2 D for correcting her near vision and -4 D for correcting her distant vision. Calculate the focal lengths of the lenses required to correct these defects.
4. Ritu observes that a glass slab and a glass prism are made from glass so they must be having similar properties. Are those two really same?
How can you differentiate between these two?
5. An astronaut who came back from space describe that twinkling of stars is more pronounced when viewing them from Earth's surface than when observing them from space. Can you give explanation for the phenomena observed for the same.

3. Long answer type questions

1. Use two identical glass prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white the help of labeled ray diagram.
2. Explain in brief the reason for each of the following:
(a) Advanced sun-rise
(b) Delayed sun-set
3. How are rainbows formed? Draw a labeled diagram to show rainbow formation.
4. What is Tyndall effect? Arrange an experiment to show the scattering of light in a colloidal solution.
5. (i) Why are we not able to see anything for few seconds when we enter a dim lit room from a bright room?
(ii) Group the listed materials in convex mirror, convex lens, concave mirror and concave lens based on their uses.
Myopia (nearsightedness), front surface of the human eye's lens, telescopes, microscopes, Magnifying glasses, Parabolic reflectors in solar cookers, Rearview mirrors, street corner traffic mirrors, Security mirrors in stores and public areas, Eyepieces of binoculars and telescopes, Reflective surfaces inside car headlights, Hyperopia (farsightedness), photography, Makeup mirrors Dentist's mirrors, Surveillance and safety mirrors in parking lots and buildings.

4. HOTS

1. Give reasons why the image distance in the eye does not change when we change the distance of an object from the eye?
2. How would the apparent sunset appear on a celestial body with no atmosphere, such as the Moon or Mars? Compare the characteristics of the apparent sunset on Earth with those on celestial bodies lacking substantial atmospheres. Explore the cultural and artistic significance of the sunset in various societies and throughout history.
3. Why are two eyes important for proper vision instead of one?

Chapter 11 ELECTRICITY

WORKSHEET 1

1. Multiple choice questions.

1. The metal used in making bulb filament is
a) Pb
b) W
c) Au
d) Fe

2. What is the potential difference between two points in a circuit if 2 coulombs of charge gain 20 joules of energy?
a) 2 volts
b) 10 volts
c) 20 volts
d) 40 volts

3. If the resistance of a wire is doubled while keeping the voltage constant, what happens to the current flowing through it?
a) It doubles.
b) It halves.
c) It remains the same.
d) It becomes zero.

4. Electrician at Rani's house describes that "short circuit" is the reason behind the black out. What does the term "short circuit" in an electrical circuit refer to?
a) A circuit with very high resistance
b) A circuit with no voltage source
c) A circuit with low resistance and no intended path
d) A circuit with too many switches

5. If a circuit has a voltage of 120 volts and a current of 5 amperes, what is the power consumption in watts?
a) 240 W
b) 600 W
c) 1,200 W
d) 6,000 W

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

1. Bronze is an alloy of copper and tin and it is not a good conductor of electricity.
2. Resistivity of an alloy is generally higher than that of its constituent metals but the alloys have low melting points then their constituent metals.
3. Electric current is the amount of charge flowing through a particular area in an hour.
4. A fuse is a safety device designed to break the circuit when current exceeds a certain value.
5. A series circuit has multiple paths for the current to flow.

3. Fill in the blanks.

1. The primary function of a _____ in an electrical appliance is to break the circuit on overflow of current.
2. A resistor with higher resistance will dissipate _____ power when the same voltage is applied across it.
3. Mangnin is alloy of ___, ____ and _____.
4. The commercial unit of electrical energy is _____.
5. _____ is the device which is often used to change the resistance without changing the voltage source in an electric circuit.

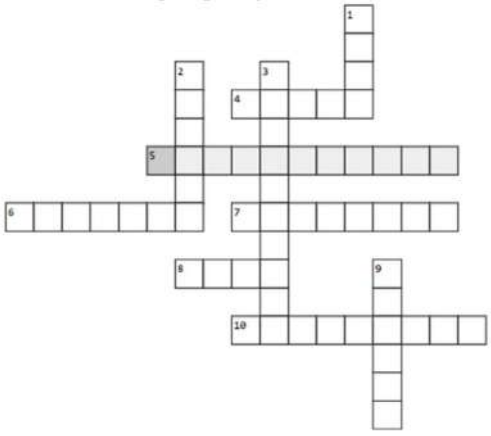
4. Correct the given sentences.

1.Electric current always flows from negative to positive terminals in a circuit.
2.Ohm's Law states that voltage is directly proportional to current in a circuit
3.Ammeter is used to measure voltage in a circuit.
4.Series circuits are commonly used in homes for lighting to conserve energy.
5.The graph of Ohm's law is hyperbole.

5. **Crossword.**

Across
4. Unit of energy equal to Newton-meter
5. The nature or material responsible of resistance
6. Electrical potential difference
7. Connection used in our houses commonly
8. Unit of power
10. Material which does not allow flow of charges

Down
1. Symbolized by straight line in circuit
2. Unit of electric current
3. Alloy of Cu and Ni
9. Fundamental property of matter that can be positive or negative



6. **Activity**

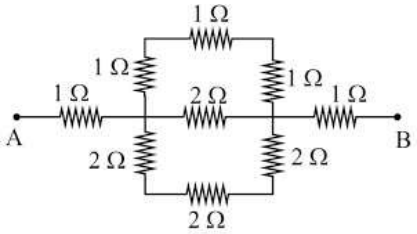
attached is the link to an interactive video which aims at understanding how batteries provide us electricity.
https://www.youtube.com/watch?v=9OVtk6G2TnQ

WORKSHEET 2

1. Very short answer type questions

1. Define one ampere.

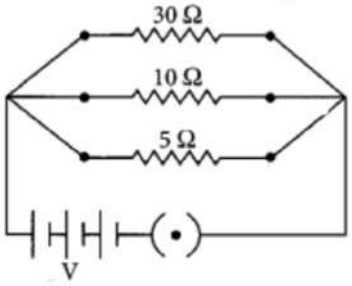
Calculate the effective resistance across points A and B



2. Name two appliances made using the heating effect of the electric current
3. What is the difference between kilowatt and kilowatt hour.
4. What is the use of a battery?
5. Power of a lamp is 120 W. Find the energy in joules consumed by it.

2. Short answer type questions

1. List the differences between parallel and series connection in circuit. How does it effect the current flow?
2. The fuse wire at Heer's house melts at 7 A. Now she wants the wire of same material to be able to near 14A. Explain whether the new fuse wire should be of smaller or larger radius than the earlier one? Give reasons.
3. Calculate the resistance of a metal wire of length 10m and area of cross section 1.7×10^{6} m^2, if the resistivity of the metal be 8.2×10^{-8} Ωm.
4. For the electric circuit given below calculate: (V= 30V)



(i) current in each resistor
(ii) total current drawn from the battery, and
(iii) equivalent resistance of the circuit.

3. Long answer type questions

1. An electric iron has a rating of 750 W; 200 V. Calculate:
(i) the current required.
(ii) the resistance of its heating element.
(iii) energy consumed by the iron in 2 hours.

2. (a) Define power and state its SI unit.
(b) A torch bulb is rated 5 V and 500 mA. Calculate its
(i) power

(ii) resistance
(iii) energy consumed when it is lighted for 2hours.

3. Draw the symbols of commonly used components in electric circuit diagrams for
(I) Open plug key
(ii) Variable resistor
(iii) Battery
(iv) Electric bulb
(v) Resistance
4. What is 1Ω resistance? Draw a graph between the potential difference and current flowing through a metallic conductor, what kind of curve will you get? Explain how would you use this graph to determine the resistance of the conductor.
5. Electric power consumption is measured in units like kilowatt-hours (kWh). Calculate the cost of running a 1,000-watt (1 kW) appliance for 5 hours at a rate of Rs.17 per kWh. How can understanding this calculation help you manage your electricity bills?

4. HOTS

1. Have you noticed the appliances like refrigerator and televisions having bright stars made on the at the corner? The slogan “More stars, More savings” have been popularized to create awareness about the electricity conservation. How do you think stars help the cause?
2. In a house 5 bulbs of 100 watt each lighted for 6 hours daily, 2 fans of 50 watt each used for 12 hours daily and an electric heater of 1.00 kW is used for half an hour daily. Calculate the total energy consumed in a month of 31 days and its cost at the rate of Rs 6.50 per kWh.
3. Investigate and describe real-world applications where series and parallel resistance configurations are intentionally used. Provide examples from various fields, such as electronics and household appliances.

Chapter 12 MAGNETIC EFFECT OF ELECTRIC CURRENT

WORKSHEET 1

1 . Multiple choice questions

1. Which of the following devices relies on the magnetic effect of electric current to function?
a) Electric heater
b) Incandescent bulb
c) Electric generator
d) Electric fan

2. In Indian households, what type of wiring system is commonly used for electrical connections?
a) Parallel wiring
b) Series wiring
c) Combined wiring
d) Star wiring

3. An alpha particle (positive charge) enters magnetic field at right angle. The direction of force acting on it will be
a) To the right
b) To the left
c) Outwards
d) Inwards

4. What is the purpose of the Earth or Ground wire in electrical circuits in homes?
a) To carry the current to appliances
b) To provide a return path for current
c) To provide a neutral wire
d) To increase voltage

5. Devices that do not use current-carrying conductor and magnetic field
a) Electric motor
b) Electric generator
c) Loudspeaker
d) Microscope

2. State whether the following statements are true or false

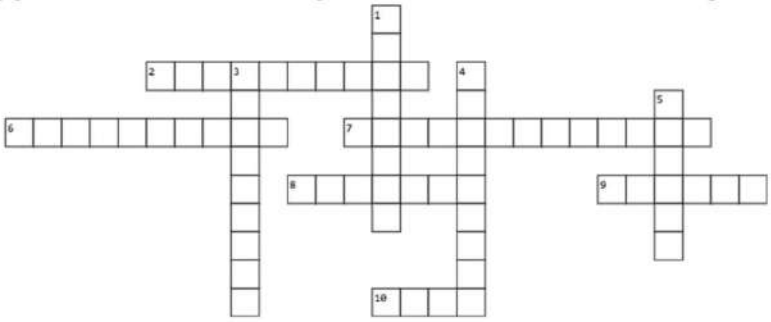
1. When coil and magnet are both stationary, the current in produced in the circuit.
2. The needle in galvanometer deflects to either side of 0 indicating the direction of the currents flow.
3. The strength of the magnetic field produced by an electromagnet decreases when the number of turns in the coil increases.
4. Fleming's Left-Hand Rule is used to explain the behavior of electric generators.
5. Ampere suggested that magnet too exerts force on the current carrying conductor.

3. Fill in the blanks

1. The line of field run ___ to ____ inside the magnet.
2. The potential difference between the red wire and the black wire in our household circuit is ___V.
3. Magnetic field inside solenoid is similar to that of _____.
4. Electromagnet consist of a core of _____ wrapped around with a coil of insulated copper wire.
5. Unit of magnetic field strength is _____.

4. Correct the following sentences
1. Fuse is the least important safety device in a circuit.
2. The standard voltage rating of domestic electrical outlets is 240V.
3. The strength of the magnetic field is shown by the _____ of the field lines.
4. The magnetic field inside a solenoid is highest towards the poles.
5. In electrical wiring in India, the live (hot) wires are typically color-coded blue or green.

6. Crosswords
Across
2. Current carrying material
6. Materials that cannot conduct current
7. Type of magnet that can be turned on and off using an electrical current
8. Device which also gives direction of current
9. Device used to break or complete the circuit
10. Device used to interrupt or break an electric circuit
Down
1. Type of circuit where components are in multiple loops
3. Thumb in right hand thumb rule indicates ____
4. Type of current in household wiring in India
5. Type of circuit where components are connected in a single loop



7. Activity
To build a simple electric generator and demonstrate the generation of electricity through the interaction of magnetic fields and motion.
Materials Needed: A strong magnet , insulated copper wire (approximately 1-2 meters), small LED bulb (light-emitting diode), tape, cardboard base, 1.5V or 9V battery
Assemble the material to create a simple electric motor (NCERT fig. 13.5)

Discuss
(i) How does the rotation of the coil within the magnetic field generates electricity through electromagnetic induction.

(ii) Explore the effects of changing the coil's speed, the number of turns in the coil, or the strength of the magnet on the brightness of the LED bulb.
(iii) Discuss the real-world applications of electric generators in power generation and renewable energy sources.

WORKSHEET 2

1. Very short answer type question

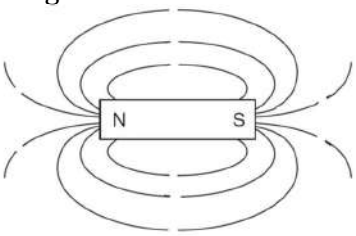
1. State the purpose of soft iron core used in making an electromagnet.
2. A current-carrying wire is placed in a magnetic field, and the current flows from east to west in the wire. The magnetic field lines run from north to south. According to Fleming's Left-Hand Rule, which direction will the force act on the wire?
3. Draw the magnetic field lines for a current produced by circular current carrying loop.
4. What did Oersted discover?
5. Mention two safety measures taken in household electric circuit.

2. Short answer type question

1. What is Fleming's Right-Hand Rule used for? How do you apply Fleming's Right-Hand Rule to find the direction of the magnetic field around a current-carrying wire?
2. Draw the circuit setup to show the electromagnetic induction.
3. Differentiate between the Fleming's right hand rule and right hand thumb rule. State their uses.
4. Discuss the usage of magnetism in medicine.
5. Explain why the magnetic field produced by current in a conductor decreases as the distances increases.

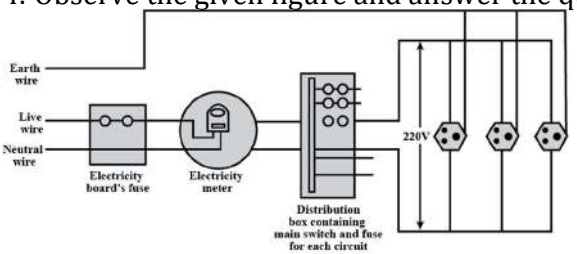
3. Long answer type question

1. In the given figure draw the arrows (at blank space) to show the direction of the line of magnetic field around the bar magnet. List the characteristics of lines of magnetic field.



(i) What is an electromagnet? List any two uses. Draw a labeled diagram to show how an electromagnet is made.
(ii) List two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed

2. What is short circuit? Explain how it is important.
3. Differentiate between right Fleming's right hand and left hand rule.
4. Observe the given figure and answer the questions.



(i) what are the usual colors of Earth wire, Live wire and Neutral wires?
(ii) what is the role of Earth wire?
(iii) why are outlet plugs places in parallel?

(iv) why are the outlet plus connected to earth wire?

5. With the help of a labeled diagram, describe an activity to show that a current carrying conductor experiences a force when placed in a magnetic field. Mention the position when this force is maximum.

4. HOTS

1. Why are two different circuits used to supply electricity to 5A (for bulbs) and 15A (for heavy appliances like geyser)?
2. Consider the application of magnetic brakes in high-speed trains. Discuss how magnetic braking works and its advantages over traditional friction-based braking systems. How does this technology contribute to efficiency in rail transportation?
3. Metal detectors at airports and security checkpoints use electromagnetic coils to generate a magnetic field. When metal objects pass through the field, it disrupts the magnetic field, triggering an alarm. Explain how the magnetic effect of electric current is central to the operation of these metal detectors.

Chapter 13 OUR ENVIRONMENT

WORKSHEET 1

1.Multiple choice questions

1.The percentage of amount of energy absorbed by the plants from sun and percentage energy transferred to next organism is respectively
a)10%, 10%
b)90%, 10%
c)1%, 1%
d)1%, 10%

2.If a deer is hunted by a lion, then the energy is transferred to
a)a decomposer from producer
b)a consumer from a producer
c)a consumer from a consumer
d)a producer from consumer

3.A school trying at adapt only eco friendly activity. Which among the following activity will NOT be prohibited
a)Littering
b)Vermi composting
c)Use of Styrofoam cups
d)Use of plastic bags

4.Excessive exposure to UV rays can cause
a)Skin cancer, tooth decay
b)Damage to immune system, skin cancer
c)Ulcers, body ache
d)Viral fever, measles

5.In 1987, UNEP succeeded in forging an agreement to freeze the production of which chemical?
a)Carbon dioxide
b)Carbon monoxide
c)Chlorofloro carbon
d)Sulphuric compounds

2.State weather following statements are true or false.

1.Biodegradable substances harm the earth worms living in soil.
2.Decomposers seldom play any role in an ecosystem since only green plants are important.
3.There is a gain of energy on moving to next trophic level.
4.CFCs are the substances also responsible for global warming as they create ozone hole which lets in harmful UV rays.
5.Deterioration in our lifestyle have resulted in greater amount of waste material generation.

3.Fill in the blanks.

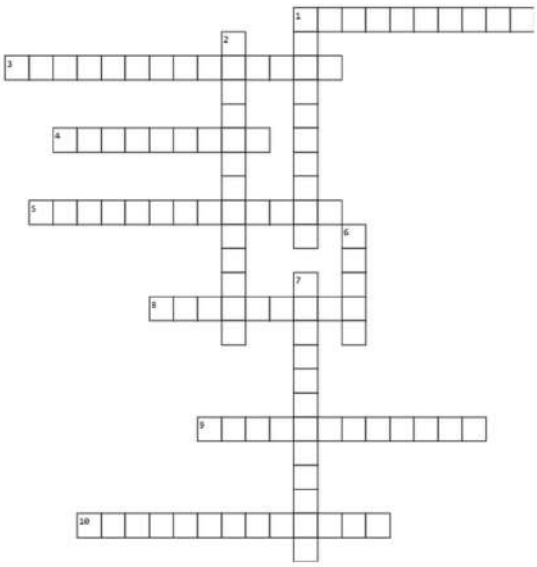
1.The various components of the ecosystem are _____

2.Carnivores organisms generally occupy the _____ trophic level of the food chain.
3.The accumulation of harmful chemicals though different trophic level is called _____. _____ usually occupying the top of the food chain have maximum concentration of harmful chemicals in them.
4._____ is the ultimate source of energy in ecosystem.
5.The ozone is a _____ atoms molecule formed by the molecules of _____ being acted upon by UV rays.

4.Crossword

ACROSS
1. Species that are at risk of becoming extinct?
3. The concept involving achieving a balance between meeting present needs and conserving resources for the future?
4. The term used to describe a community of organisms interacting with their physical environment?
5. Introduction of impurities or pollutants into a substance or area?
8. The introduction of harmful substances into the environment called?
9. Term describing the sustainable management and preservation of natural resources?
10. The process of cutting down forests called?

DOWN
1. The complete disappearance of a species from the Earth called?
2. Type of substances can be broken down by natural processes into harmless compounds?
6. The layer in the Earth's atmosphere protecting life on Earth from harmful ultraviolet (UV) radiation?
7. Word referring to the variety of life forms on Earth, including species diversity and genetic diversity?



5.Activity

1.Assign students to maintain a diary in which they note down each and every thing they throw in a dustbin for a week. At the end of the week ask students to check the total non biodegradable and biodegradable waste they generate individually and as a class.

How could this amount of waste be reduced? In what areas could this waste be put in and made use of?

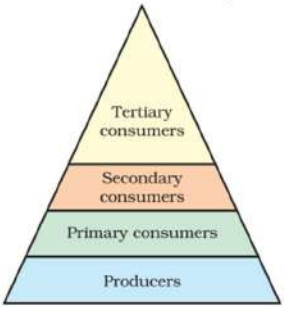
2.Discuss the message conveyed in the attached video. Why is the segregation of the waste important?

https://youtu.be/ESbD2NU_xZg

WORKSHEET 2

1. Very short answer type questions

1. What does the given figure signify? Give examples for each trophic levels.



2.How do harmful chemicals enter the food chain?
3.What is the Ozone layer? Mention the chemical formula of ozone.
4.What is the term used to describe the kind of gases which entrap the heat and assist to global warming? Give example.
5.Are the number of trophic levels in the food chain limited? If so, why?

2. Short answer type questions

1.What is ecosystem? Describe the components of ecosystems with suitable examples.
2.What are biodegradable and non- biodegradable substances? Give few examples of both from your surrounding.
3. What category of organisms can be employed to make vermi compost? Explian their role in making of compost and in environment.
4.What is global warming and what its causes? Mention some human activities responsible for global warming.
5.Why is garbage management? List some of the methods of garbage disposal being carried out by your home.

3. Long answer type questions

1.What are natural resources, and why is their conservation essential for future generations? Provide examples of renewable and non-renewable resources and explain how they can be sustainably managed.
2.Explain the importance of water as a natural resource. Describe the factors leading to water scarcity and suggest strategies for the efficient management of water resources.
3.What is air pollution? What are its causes and consequences. Discuss the role of individuals and government in mitigating air pollution.
4.What is ozone layer? Describe its significance for life on Earth. Discuss the causes of ozone depletion and the measures taken to address this issue.
5.Why is it important for individuals and societies to adopt ethical principles when making decisions about resource use and environmental protection? Discuss in the terms of environmental ethics.

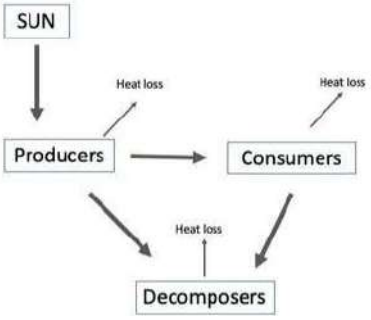
4. HOTS

1.Several think tanks around the nation and even the world have shared their prediction of cities like Mumbai and Kolkata to disappear into the sea by the year

2050. The rising population in these metropolitan cities adds up to the calamity that awaits these cities in future. What do you think could be the cause behind so? What several factors are coming together that could cause us to loose such important cities?

2.What would happen if suddenly all the organisms of a trophic level are completely removed from the ecosystem?

3. Observe the given figure showing flow of energy in environment.



Where does the energy in sun comes from? Discuss.