

Class 7

Section I
Suggested pedagogical process
The learner is to be provided with opportunities in pairs /groups / individually in an inclusive setup and encouraged to —
Explore surroundings, natural processes, phenomena using senses viz. Seeing, touching, tasting, smelling, hearing
Pose questions and find answers through reflection, discussion, designing and performing appropriate activities, role plays, debates, use of ICT, etc.
Record the observations during the activity, experiments, surveys, field trips, etc.
Analyse recorded data, interpret results and draw inference / make generalisations and share findings with peers and adults
Exhibit creativity presenting novel ideas, new designs /patterns, improvisation, etc.
Internalise, acquire and appreciate values such as cooperation, collaboration, honest reporting, judicious use of resources, etc.

Section II	
Learning Outcomes of NCERT	Measuring the LOs
The learners -	
Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.	Examines observable features, i.e., appearance, texture, function, aroma, etc. in order to identify materials and organisms
Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function	Examines and explains properties, structure and functions of materials and organisms, in order to differentiate them
Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes	Explains properties /characteristics of materials and organisms in order to classify them
Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?	Conducts simple investigations on his /her own in order to seek answers to queries
Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.	Examines and explains processes and phenomenon in order to relate them with causes

Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.	Explains processes and phenomena in order to relate to science behind the phenomena /processes and develop scientific thinking skills
Writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc.	Writes word equation in order to express chemical reactions
Measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.	Measures and calculates in order to demonstrate understanding of measurability of various scientific processes /phenomena
Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.	Draws labelled diagrams /flow charts of organisms /structures /processes in order to demonstrate knowledge of structure /processes /relationships
Plots and interprets graphs e.g., distance- time graph	Plots graphs on the basis of given data, in order to interpret it
Constructs models using materials from surroundings and explains their working, e.g., stethoscope; anemometer; electromagnets; newton's colour disc ,etc.	Constructs models using materials from surroundings and explains their working in order to demonstrate scientific knowledge and understanding of how it works
Discusses and appreciates stories of scientific discoveries	Discusses stories of scientific discoveries /inventions, both orally and in writing, in order to critically appreciate them.
Applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.	Applies learning of scientific concepts in daily life /real life situations in order to solve problems /give solutions /take preventive measures /etc
Makes efforts to protect environment, e.g., following good practices for sanitation at public places; minimising generation of pollutants; planting trees to avoid soil erosion; sensitising others with the consequences of excessive consumption of natural resources, etc.	Makes efforts to apply to daily life the understanding of environment and steps to conserve it, in order to contribute to the protection of the environment.
Exhibits creativity in designing, planning, making use of available resources, etc.	Designs, plans, makes use of available resources, etc.in order to exhibit creativity.
Exhibits values of honesty, objectivity, cooperation, freedom from fear and prejudices	Designs, plans, makes use of available resources, etc.in order to exhibit values of honesty, objectivity, cooperation, freedom from fear and prejudices

Section III**LEARNING OBJECTIVES MAPPED WITH LEARNING OUTCOMES ADAPTED BY CBSE**

Chapter no	Learning Objectives	Learning Outcomes
1. Nutrition in Plants	Examine different methods of nutrition in order to differentiate between autotrophic and heterotrophic nutrition	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Evaluate other plants in their surroundings & classify them as autotrophs, heterotrophs, saprotrophs, parasitic or symbiotic based on their nutritional requirements	Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes
	Categorize features of insectivores, saprophytes and symbionts, based on their similarities.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Evaluate if leaves that are red, purple/colours other than green might show lesser photosynthetic activity than green leaves	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Construct the cause & effect model of plant rotation done by farmers	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Recall details/definitions specific to autotrophic mode of nutrition in plants / photosynthesis / detection of photosynthetic activity of plants/nutrients other than carbohydrates, in plants	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Define Nutrition & its importance to living organisms	

1. Nutrition in Plants	Elaborate the photosynthetic process in plants		
	List the nutrients and sunlight requirements in plants in order to explain how these are fulfilled through enquiry activity		
	Relate the nutritional requirements of different organisms (plants & animals) to the environment or surroundings for survival		
	Describe the process of photosynthesis with the help of word/chemical equation		Writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc.
	Draw a schematic diagram of a section through a leaf in order to pictorially represent photosynthesis		Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
Establish the relationship between Rhizobium bacteria & leguminous plants			

Chapter no	Learning Goals	Learning Outcomes
2.Nutrition in animals	Illustrate human digestive system with the help of a well labelled diagram & elaborate the process & function of each part	Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.
	Compare & contrast the features of digestive system of grass-eating animals with those of humans.	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function

	Classifies animals based on their modes of feeding.	Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes
	Perform the starch test on raw and chewed food in order to infer the role of saliva.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Recall details pertaining different modes of acquiring food.	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Summarize the functions of Human digestive system.	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Recall details pertaining to nutrition in amoeba	
	Illustrate human digestive system with the help of a well labelled diagram & elaborate the process & function of each part	

Chapter no	Learning Objectives	Learning Outcomes
3. Fibre to Fabric	Examine selective breeding process for obtaining special characters in the offspring, e.g. soft under hair in sheep	Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes
	Compare coarse beard hair & soft under hair of animals based on their utility	
	Examine selective breeding process for obtaining special characters in the offspring, e.g. soft under hair in sheep	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.

3. Fibre to Fabric	Outline the steps involved in processing of fibres into wool	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Outline the steps involved in obtaining silk from cocoon	
	Describe and illustrate diagrammatically the life cycle of silk moth	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Critique the risk factors associated with wool industry & appreciate the efforts of people involved in it	Discusses and appreciates stories of scientific discoveries
	Explain the significance of silk in textile industry	
	Evaluate the contribution of silk in Indian Economy and appreciate our weavers for the intricate & dedicated efforts	

Chapter no	Learning Objectives	Learning Outcomes
4. Heat	Distinguish the Clinical thermometer from Laboratory thermometer (range, least count, units of measurement)	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	List precautions while using a clinical and laboratory thermometer in order to identify the role of a kink.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Devise an activity or elaborate a situation to show the rate of thermal conduction, convection & radiation	

4. Heat	Devise an activity to show that woolen clothes are insulators/ poor conductors of heat	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Critique the need for Laboratory thermometer while doing experiments in the laboratories	
	Explain why a substance remains in the same temperature in a Thermos flask or vacuum bottle	
	Corelate the modes of transfer of heat to the usage of different clothes in different parts of the world (Polar, temperature, tropical, etc.)	
	Observe the heating and cooling of objects in order to describe conduction	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Apply the concept of convection to heating of land and water in order to predict the description of land and sea breeze	
	Categorize a given substance as hot & cold by a reliable measure (using temperature without touching)	Measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.
Distinguish the Clinical thermometer from Laboratory thermometer (range, least count, units of measurement)		

Chapter no	Learning Objectives	Learning Outcomes
5. Acids, Bases and Salts	Examine the common substance used at home based on taste and touch and classify them as acidic or basic	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Summarizes observations with respect to behavior of indicators in acidic and basic solutions	
	Identify neutralization reactions and its characteristics	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?

5. Acids, Bases and Salts	Summarizes observations with respect to behavior of indicators in acidic and basic solutions	
	Identify neutralization reactions and its characteristics	Writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc.
	Illustrates neutralization reactions seen in everyday life	
	Evaluate the effectiveness of certain neutralization reactions employed in everyday life, based on observed data	Discusses and appreciates stories of scientific discoveries

Chapter no	Learning Objectives	Learning Outcomes
1. Physical and chemical changes	Infer the effects which help you to identify a physical change	Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.
	Summarize various features accompanying chemical change	
	Evaluate a given set of changes (in everyday life) on attributes of physical or chemical changes to distinguish between them	
	Defend why rusting of iron is a chemical change	
	Differentiates physical changes from other changes (periodic changes etc) in order to characterize the common feature of physical changes	Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes
	Design an experiment to prevent rusting by eliminating/controlling a particular condition for rusting	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Illustrate the usage of crystallization in purification of various salts	
	Judge why better crystallization occurs at lower temperatures	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.

6. Physical and chemical changes	Extrapolate the understanding of chemical change to new term Chemical Reaction & Chemical Bonding	Writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc.
	Illustrates chemical change with specific examples	

Chapter no	Learning Objectives	Learning Outcomes
2. Soil	Compare different types of soils in connections with properties shared along with contrasting features.	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Determine the percolation of given soil using the time of percolation.	
	Examine different soil samples in order to infer that moisture is contained in soil.	
	Examine different soil samples in order to calculate the percentage of water absorbed and assess moisture absorbing property of soil	
	Classify soil into different categories based on its properties.	Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes
	Describe all the layers in the soil profile in order to classify them into A-, B-, C- horizon and bedrock.	
	Determine the percolation of given soil using the time of percolation.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Examine different soil samples in order to infer that moisture is contained in soil.	
	Examine different soil samples in order to calculate the percentage of water absorbed and assess moisture absorbing property of soil	

7. Soil	Evaluate the characteristics of soil that will support a particular type of crop with reasons	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Construct a cause & effect model of effects of soil pollution on life on earth.	
	Predict the consequences of absence of soil on life on earth.	Discusses and appreciates stories of scientific discoveries
	Construct a cause & effect model of effects of soil pollution on life on earth.	
	Construct a cause & effect model of effects of soil pollution on life on earth.	Applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.

Chapter no	Learning Goals	Learning Outcomes
8. Winds, storms and cyclones	Demonstrate an experiment in order to conclude that high speed winds are accompanied by low air pressure by the method of scientific inquiry.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Demonstrate an experiment in order to conclude that air moves from a region of high pressure to a region of low pressure.	
	Demonstrate an experiment in order to conclude that air expands on heating.	
	Apply the knowledge that air exerts pressure in order to explain phenomenon of cyclones.	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Attribute the direction of movement of wind currents to the uneven heating of atmosphere at various regions of earth & rotation of earth.	
	Recall the concept of land breeze and sea breeze in order to describe monsoon winds.	
	Suggest the possible reasons for absence of cyclones/thunderstorms in certain areas where as their abundance in others.	
	Describe the structure of a cyclone in order to list factors that contribute to its development and explain the damage it causes.	
	Recall details pertaining to air & effects of air pressure.	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Recall details about safety measure & precautions against Cyclones, Thunderstorms & Tornadoes	Discusses and appreciates stories of scientific discoveries
Implement knowledge of storms/cyclones/tornados and safety measure and precautions against them in order to devise new safety measures and precautions.		

8. Winds, storms and cyclones	Summarize the consequences of absence of precautionary measures against storms/cyclones/tornados, etc.	
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Chapter no	Learning Objectives	Learning Outcomes
9. Soil	Compare different types of soils in connections with properties shared along with contrasting features.	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Determine the percolation of given soil using the time of percolation.	
	Examine different soil samples in order to infer that moisture is contained in soil.	
	Examine different soil samples in order to calculate the percentage of water absorbed and assess moisture absorbing property of soil	
	Classify soil into different categories based on its properties.	Classifies materials and organisms based on properties /characteristics, e.g., plant and animal fibres; physical and chemical changes
	Describe all the layers in the soil profile in order to classify them into A-, B-, C- horizon and bedrock.	
	Determine the percolation of given soil using the time of percolation.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Examine different soil samples in order to infer that moisture is contained in soil.	
	Examine different soil samples in order to calculate the percentage of water absorbed and assess moisture absorbing property of soil	

9. Soil	Evaluate the characteristics of soil that will support a particular type of crop with reasons	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Construct a cause & effect model of effects of soil pollution on life on earth.	
	Predict the consequences of absence of soil on life on earth.	Discusses and appreciates stories of scientific discoveries
	Construct a cause & effect model of effects of soil pollution on life on earth.	
	Construct a cause & effect model of effects of soil pollution on life on earth.	Applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.

Chapter no	Learning Objectives	Learning Outcomes
	Define cellular respiration in order to differentiate between aerobic and anaerobic respiration.	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Examine inhalation, exhalation and breathing rate in own body in order to analyse the effect of various activities on breathing rate.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Observe the reaction of exhaled air with lime water in order to infer the gas exhaled.	

10. Respiration on organism	Examine inhalation, exhalation and breathing rate in own body in order to analyse the effect of various activities on breathing rate	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Construct a cause and effect model of respiratory processes in animals and plants, as an extension of available resources and respiratory organs/features.	
	List the functions performed by a cell in order to infer the need of energy for various processes	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Recall details/definitions of terminology related to respiration in humans.	
	Describe the process of breathing in humans in order to explain the role of nostrils (hair and mucus), trachea, lungs, ribs and diaphragm.	
	Describe the process of respiration in cockroach, earthworm, fish and plants in order to predict consequences of absence of respiratory organs/features, in animals or plants.	
	Select distinguishing features and categorize them as belonging to respiratory systems in plants and human beings (stomata & lungs).	
	Define cellular respiration in order to differentiate between aerobic and anaerobic respiration.	Writes word equation for chemical reactions, e.g., acid-base reactions; corrosion; photosynthesis; respiration, etc.
	Examine inhalation, exhalation and breathing rate in own body in order to analyse the effect of various activities on breathing rate.	Measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.
Describe the process of breathing in humans in order to explain the role of nostrils (hair and mucus), trachea, lungs, ribs and diaphragm.	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.	

10. Respiration on organism		
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Chapter no	Learning Objectives	Learning Outcomes	
1. Transportation in Animals and Plants	Draw a contrast between the functions of arteries and veins, in the functioning of the circulatory system.	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function	
	Analyse the implications of intermixing of oxygenated and deoxygenated blood in order to explain the existence of four chambers in the heart.	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.	
	Interpret reasons for discrepancies in the process of urine formation and expulsion.		
	Predict reasons for decreased absorption of water by plants.		
	11. Transportation in Animals and Plants	Outline functions carried out by parts of the circulatory system as being contributory to proper circulation of oxygen.	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
		Describe the function of blood and its constituents.	
		Describe the location and function of the heart.	
		Recall details/functions of parts of the excretory system	
Explain the process of transport of water, minerals and food in plants in order to differentiate between xylem and phloem.			
Explain the process of transpiration in order to infer its advantages.			
Study excretion in other organisms.			

11. Transportation in Animals and Plants	Examine own pulse in order to infer the pulse rate and define it.	Measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.
	Define heartbeat in order to design a model of a stethoscope to measure it.	
	Observe own heartbeat and pulse rate after different activities in order to draw a relationship between them.	
	Describe the location and function of the heart.	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Recall details/functions of parts of the excretory system	Constructs models using materials from surroundings and explains their working, e.g., stethoscope; anemometer; electromagnets; newton's colour disc ,etc.
	Define heartbeat in order to design a model of a stethoscope to measure it.	
	Compare situations of effective and ineffective functioning of the excretory system, in connection with functions of the parts of the system	Discusses and appreciates stories of scientific discoveries
	Attribute reasons for ineffective transportation of materials in plants, to functions of their parts.	
	Explain the importance and need for blood donations.	
Analyse the condition of kidney failure in order to explain the process of dialysis.		

Chapter no	Learning Objectives	Learning Outcomes
	Infer the mode of reproduction from the features of a plant	Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.

12. Reproduction in plants	Observe and recall how different types of plants grow new ones in order to differentiate between asexual and sexual modes of reproduction	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Distinguish between any two modes of asexual reproduction, in connection with parts involved, etc.	
	Compare the outcomes of sexual reproduction in unisexual plants with those in bisexual plants	
	Define reproduction in order to identify its need	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Recall details/definitions pertaining to sexual mode of reproduction in plants	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Critique the idea that any one of the categories of seeds might disperse better than another category, in connection with reference to their features	Discusses and appreciates stories of scientific discoveries
	Draw a contrast between any two modes of asexual reproduction, in connection with parts involved, etc.	

Chapter no	Learning Objectives	Learning Outcomes
13. Motion and time	Paraphrase the to and fro motion of simple pendulum/metallic bob suspended by a string is known as oscillatory motion	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Recall change in position of the body with respect to surroundings as motion.	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and

13. Motion and time	Identify repetition of natural events at definite/regular intervals of time/fraction of second in order to describe periodicity.	systems in human and plants; heating and magnetic effects of electric current, etc.
	Infer from the given data that time taken to complete one oscillation as time period of simple pendulum.	
	Paraphrase the to and fro motion of simple pendulum/metallic bob suspended by a string is known as oscillatory motion	
	Recall the definition of speed (average speed) as distance covered in unit time.	Measures and calculates e.g., temperature; pulse rate; speed of moving objects; time period of a simple pendulum, etc.
	Recall the instrument used to measure speed.	
	Derive the mathematical formula to calculate speed in order to compare the speeds of various moving objects (uniform and non-uniform motion).	
	Calculate speed or distance or time taken if any two of these three are quantities are provided	
	Utilize data given in odometer to measure distance travelled, average speed for a given time.	
Record data for distance covered in fixed intervals of time for a moving object in order to plot a distance-time graph and interpret the shape.	Plots and interprets graphs e.g., distance- time graph	

Chapter no	Learning Objectives	Learning Outcomes
	Examine how that an electric current can be used as a magnet in order to list its uses.	Explains processes and phenomena, e.g., processing of animal fibres; modes of transfer of heat; organs and systems in human and plants; heating and magnetic effects of electric current, etc.
	Outline the construction and uses of electromagnets and electric bell.	

14. Electric current and its effects	Translate a circuit with actual components into a circuit diagram.	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Observe heating effect of current in order to enlist its uses and compare it for conductors of different material, length and thickness.	
	Perform a simple activity to demonstrate the magnetic effect of an electric current.	Constructs models using materials from surroundings and explains their working, e.g., stethoscope; anemometer; electromagnets; newton's colour disc ,etc.
	Recall the precautions to be observed while working with electricity.	
	Summarize the benefits of using CFLs over ordinary electric bulbs.	Discusses and appreciates stories of scientific discoveries
	Evaluate the role of a fuse wire and MCBs provide for electrical safety in a circuit.	

Chapter no	Learning Objectives	Learning Outcomes
15. Light	Recall reflection as change in direction of light by polished surfaces/mirrors.	Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.
	Observe and describe image formed by a plane mirror in order to enlist its uses. (image/object, erect/inverted, virtual/real, distance from the mirror)	
	Conclude from observations that concave mirror forms real, inverted image at all places except when the object is too close whereas convex mirror is erect, virtual & smaller size than the object.	

15. Light	Differentiate between convex and concave lenses based on the image formed when object is placed at different positions.	Differentiates materials and organisms such as, digestion in different organisms; unisexual and bisexual flowers; conductors and insulators of heat; acidic, basic and neutral substances; images formed by mirrors and lenses, etc., on the basis of their properties, structure and function
	Explain the formation of a rainbow.	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	Analyze why virtual image cannot be obtained on the screen but still can be photographed.	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Explain the formation of a rainbow.	Constructs models using materials from surroundings and explains their working, e.g., stethoscope; anemometer; electromagnets; newton's colour disc ,etc.
	Analyze the reason behind 'AMBULANCE' written as its mirror image on the hospital vehicles/ambulances.	Discusses and appreciates stories of scientific discoveries
	Attribute to the type of image formed by convex mirror for its utility as rear-view mirror in the vehicles	
	Outline the important uses of spherical mirrors & lenses.	

Chapter no	Learning Objectives	Learning Outcomes
	Recall process that generate waste water that goes down the drains from sinks, showers, toilets, laundries etc.	Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.

16. Water: A precious resource	Examine the role of plants in water management	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	List the means of access to water in order to trace their origin to the water cycle.	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Describe infiltration i.e. seepage of water into the ground in order to define the water table and aquifer	
	Construct a cause & effect model of depletion of ground water table.	
	Analyse the rainfall map of India in order to attribute reasons and factors leading to shortage and excess of water in major areas.	
16. Water: A precious resource	Recall the water cycle in order to describe the processes encompassed by it	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Suggest some (of his/her own) methods for recharging ground water table	Discusses and appreciates stories of scientific discoveries
	Suggest the steps for efficient water management at individual/community level.	
	Elaborate the steps to be taken by the public/private authorities for improved water supply	
	Visualize the percentage of freshwater available on the Earth in order to conclude the need for water conservation.	Applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in
Suggest some (of his/her own) methods for recharging ground water table		

	Suggest the steps for efficient water management at individual/community level.	proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.
	Elaborate the steps to be taken by the public/private authorities for improved water supply/debate on steps taken/to be taken by the Government for the supply of clean drinking water to people	

Chapter no	Learning Objectives	Learning Outcomes
17. Forests: Our Lifeline	Infer reasons for the aerial appearance of forests (as shown in the chapter), in connection with types of trees/shapes of trees.	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Create a flowchart of the food web, taking into consideration some examples of living beings, used in the chapter	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Outline features of forests that are responsible for sustenance of life.	Applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.
	Design a forest ecosystem by considering a few plants and animals and explaining how they support one another.	

Chapter no	Learning Objectives	Learning Outcomes
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18. Wastewater story	Recall the journey of used water as waste water/ water that goes down the drains from sinks, showers, toilets, laundries	Identifies materials and organisms, such as, animal fibres; types of teeth; mirrors and lenses, on the basis of observable features, i.e., appearance, texture, functions, etc.
	Perform various processes related to treatment of wastewater in order to describe processes inside a Wastewater Treatment Plant	Conducts simple investigations to seek answers to queries, e.g., can extract of coloured flowers be used as acid-base indicator? Do leaves other than green also carry out photosynthesis? Is white light composed of many colours?
	List the uses of water in everyday life in order to identify various source of contamination	Relates processes and phenomena with causes, e.g., wind speed with air pressure; crops grown with types of soil; depletion of water table with human activities, etc.
	Define sewage and list its components in order to identify their points of origin	
	Make a flow chart/line diagram of sewage route from all the various sources of generation to the treatment plant	Draws labelled diagrams / flow charts e.g., organ systems in human and plants; electric circuits; experimental set ups; life cycle of silk moth, etc.
	Outline factors responsible for scarcity of clean water and list some waterborne diseases in order to suggest methods of their prevention	Applies learning of scientific concepts in day-to-day life, e.g., dealing with acidity; testing and treating soil; taking measures to prevent corrosion; cultivation by vegetative propagation; connecting two or more electric cells in proper order in devices; taking measures during and after disasters; suggesting methods for treatment of polluted water for reuse, etc.
	Conduct a water contamination survey in order to devise a plan for good sanitation practices and avoidance of contagious diseases	Makes efforts to protect environment, e.g., following good practices for sanitation at public places; minimising generation of pollutants; planting trees to avoid soil erosion; sensitising others with the

18. Wastewater story

Devise and execute a step wise plan for treatment of waste water

consequences of excessive consumption of natural resources, etc.