

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 1 - MEASUREMENT - 12 PERIODS

Expected specific outcomes of learning	Content in Terms of Concepts	Curriculum Transactional Strategies	Illustrations	Evaluation	No. of Periods allotted
1	2	3	4	5	6
Recalls measurements of length. Understands the method of measurement of area of regular surfaces	1.1 Indirect method of measurement of thickness of wire, diameter of cylinder. Area of regular surfaces.	Demonstrates how, the length of 10/20 turns of coil can lead to calculation of diameter of wire. Explains the measurement of regular areas of book, class room. Explains how to measure the area of regular surfaces	Lists out some examples of regular surfaces. Illustrate the simple mathematical formulae for calculating areas of regular surfaces.	What is the unit of area? The length of a rectangular field is 50m and its breadth is 40m. Find its area.	2
Develops skills in measuring areas of irregular surfaces.	1.2 Areas of irregular surfaces	Describes the method of measuring the area of a leaf or irregular glass plate using a graph sheet.	Attempts to measure the areas of irregular surfaces with graph sheets.	Give some examples of irregular surfaces.	1
Observes the measurement of volume of solids.	1.3 Measurement of volume of regular objects.	Determines the volume of regular objects using known formulae-cube, sphere, cylinder etc.	Estimates the volume of brick, drum water tank and compares with measurement	The length, breadth and height of a box are 50 cm, 10 cm and 20 cm. Find its volume.	2

1	2	3	4	5	6
Develops skill in measurement of the volume of irregularly shaped solids.	1.4 Volume of irregularly shaped solids.	Practices measurement of volume of irregularly shaped solids by displacement method using measuring cylinder / overflow can.	Measures the average volume of lead shots.	Suggest a method to find the volume of a solid such as cork which floats on water. Give a method to find the volume of a substance soluble in water.	1
Understands the density of matter.	1.5 Density and its determination	Demonstrates that same volume of different substances have different masses	Tabulates the density of some common solids and liquids.	A Block of iron is 5 cm x 5 cm x 4 cm its mass is 750 gm. What is the volume of the block? What is its density?	2
Appreciates the accuracy of various timing devices like stop watch, clock, pendulum clock, electronic clock	1.6 Measurement of time.	Measures the time interval of 50 skipping ; finds out the average time of one skipping.	Measures the time of 100 pulses in the wrist hence finds the time interval between two pulses.	What is the time taken for one rotation of the earth? Name the devices used for the accurate measurement of time.	2
Recognizes the relation between period and length of a simple pendulum.	1.7 Simple pendulum - second's pendulum	Observes the variation of time period with length of the simple pendulum.	Explains the variation of time period with respect to amplitude, mass and material of bob of the pendulum.	What is second's pendulum?	2

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 2 - WATER - 24 PERIODS

Expected Specific Outcome Of Learning	Content In Terms Of Concepts	Curriculum Transactional Strategies	Illustrations	Evaluation	No.of Periods allotted
1	2	3	4	5	6
Recognises the essentiality of water for livelihood.	2.1 Importance of water for sustaining life.	4/5 Of the earth surface 2/3 of human body made up of water. Most of foods are consumed in water media. Usage of water in industry, domestic, agriculture.	Chart showing sources of water.	What is the minimum quantity of water required for human being?	2
Sees relationship between different states of water	2.2 Different states of water and their interchangeability	Emphasis should be made such that ice, water and steam are nothing but same compound in different physical states.	Diagrammatic explanation is given for the process of interchangeability.	What is evaporation? wheather boiling of water means conversion of solid in to liquid or liquid into vapour?	2
Recognises water as universal solvent.	2.2.1 Water as a solvent.	Explanation of solubility and insolubility.	common salt in water - solubility. Iron in water- insolubility.	Why is E31water cosidered to be the best solvent?	1
Understands the constancy of water through water cycle.	2.3 Water cycle in nature.	Knowledge should be imparted to explain how water is obtained and it's recycling in nature.	Diagram of hydrologic cycle.	Explain hydrologic cycle.	2
Understands the causes for water pollution and the need for prevention of pollution.	2.4 Water pollution. a) Causes b) Prevention.	Explanation for water polluiton. a)Causes for water pollution are listed. b) Different methods of prevention of water polution are mentioned.	Suitable diagram showing different modes of water pollution. Experiment to show breaking time of froths of different water samples.	State the different modes of water pollution and means of preventing the same.	6

1	2	3	4	5	6
Analyses the composition of water	2.5 Composition of water.	Electrolysis of water. Composition of pure water H:O =1:8 should be emphasised. Dissolved molecular Oxygen in water -essential for sustaining of life.	Diagram to show electrolysis of water.	What is the percentage composition of elements present in water?	2
Knowledge about physical properties of water.	2.5.1 Physical properties of water -freezing and boiling.	Reversibility of freezing and boiling should be emphasised.	Distillation set up.	Why boiling of water in a closed vessel is known as a reversible change?	1
	2.5.2 Density and volume of water and ice.	Reason for floating of ice on water.	Experiments showing ice cubes on water.	Explain the principle behind floating of ice on water.	1
Recognises saline nature of sea water.	2.6 Salinity of sea water.	Dissolution of salts present in minerals as source of salinity of sea water.	Suitable diagram to show the dissolution of different kinds of salts in sea water.	Why sea water is found to be saline in taste?	2
Analyses the conversion of saline water into potable water.	2.6.1 Conversion of sea water into potable water.	Brief explanation using a reverse osmosis technique for the conversion of saline water into potable water.	Schematic diagram of conversion of sea water into potable water.	How sea water can be converted into drinking water?	2
Analyses how water treatment is done.	2.6.2 Water treatment.	Brief explanation regarding treatment of water obtained from different sources into drinking water-chlorine gas to kill germs, adding alum to remove suspended particles, bleaching powder is added to tank water.	Chart showing treatment of contaminated water into potable water.	Why is water to be treated?	1
Recognises the importance of rain water.	2.7 Rain water harvest.	Method of rain water harvest can be explained.	Suitable diagram to explain rain water harvest.	Explain the importance of rain water harvest.	2

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 3 - STRUCTURE OF MATTER - 20 PERIODS

Expected Specific Outcome Of Learning	Content In Terms Of Concepts	Curriculum Transactional Strategies	Illustrations	Evaluation	No. Of Periods allotted
Recognises three physical states of matter.	3.1. Existence of water in different physical states.	Three physical states are explained with suitable examples.	Diagrams to show three physical states.	What are different states of water?	2
Analyses miscibility & immiscibility of liquids	3.1.1. Miscibility & immiscibility of liquids.	Miscibility is explained with suitable examples. Immiscibility- water and kerosine, & water and oil.	Suitable diagrams- simple experiments to explain miscibility and immiscibility.	Explain with suitable examples. Miscibility and immiscibility of water with other liquids.	2
Recognising the methods of interchangeability and finds out reasons for the same.	3.2. Interchangeability of different states of water. 3.2.1. Solid - liquid 3.2.2. Liquid - gas 3.2.3. Solid - gas	Interchangeability of ice cube into water and vice versa. Evaporation and condensation of water- explained. Heating of iodine & Camphor.	Suitable diagrams	Explain the process of sublimation with two examples.	3
Students recall symbols of elements	3.3. Definition of elements, symbol of elements, simple methods of representing names of elements. 3.3.1. Direct name 3.3.2. Names derived from Latin & Greek 3.3.3. Alchemy 3.3.4. Dalton's atomic theory	Symbols for common, basic elements are given showing the table of elements with symbols. Transmutation of gold into iron and vice-versa can be cited as examples to an art of Alchemy	Chart showing names & symbols of elements. (First 10 elements)	Write the symbols of the following. 1. Carbon 2. Chlorine 3. Iron 4. Silver 5. gold.	6

1	2	3	4	5	6
Impress water, common salt, sugar, chalk etc. as examples for compounds	3.4. Compounds 3.4.1. Definition with examples	Representative elements present in human body like Calcium as Calcium phosphates in bones & teeth. Iron in red blood corpuscles as haemoglobin, Magnesium as Chlorophyll in greeny leaves & vegetables can be explained.	Chart of compounds that we see in our daily life.	How compounds are formed from elements? State whether water is a compound or mixture. Justify your answer.	3
Recognises the uses of common compounds in daily life.	3.4.2. Compounds in daily use Plastics, cotton, Dyes, Baking soda, washing soda, Bleaching powder Sodium chloride, sugar, etc.	Common compounds of our daily life in solid, liquid & gaseous states are identified	Diagrams showing different compounds used in daily life.	Mention some important compounds of daily life.	2
Recalls the property of air & mixture of fertilizers. Discriminates between Mixtures & Compounds	3.5. Mixtures- Definition 3.5.1. Distinguish between compounds & Mixtures	Mixture is defined- distinction of compounds & mixtures are explained.	Suitable diagram to explain the separation of components from the mixture of wood dust iron & common salt.	Mention the differences between Mixtures & Compounds.	2

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 4 - ACIDS, BASE AND SALTS - 15 PERIODS

Expected Specific Outcome Of Learning	Content In Terms Of Concepts	Curriculum Transactional Strategies	Illustrations	Evaluation	No. Of Periods allotted
Recognises acids used in our daily life	4.1 Acid- definition 4.1.1 Acids used in day to day life and their sources.	Some important acids used in our day to day life are listed with their sources Examples tomato, vinegar,citrusfruits, bile acids, milk,tamarind,stings of ants,bees etc.	Diagrams of fruits, milk and other sources, mentioning their acids.	Mention different sources of acids found in day to day life	1
Recalls some common acids	4.1.2 Some common acids	Listing some Common acids like Hydrochloric acid, sulphuric acid, Nitric acid Acetic acid etc.	Diagram of acid bottles.	What are the common acids used in the laboratory?	1
Recalls physical properties	4.1.3 Physical Properties	Mentioning the physical Properties like solid,liquid sour taste,Reaction with litmus paper.		Mention some Common physical properties of acids.	2
Recalls chemical properties	4.1.4 Chemical Properties	Reaction with metals- liberation of hydrogen. Reaction with bases.	Chemical equation showing liberation of hydrogen,reaction with base.	What happens when zinc is added to dil HCl?	
Cites examples of bases	4.2 Bases- definition	Define with examples.	Tabular Coloumn to indicate different colours given by acids & bases on litmus test.		

Recognises some Common bases.	4.2.1 Some Common bases	Common bases and basic substances of daily life			
	4.2.2 Physical Properties	Soapy to touch; Litmus test.			
Analyses Physical properties					
Recalls chemical properties	4.2.3 Chemical Properties	Liberation of OH ⁻ . Reaction with metals, acids etc,	Reaction with metals and acids.		
Reognises caustic nature	4.2.4 Caustic nature	Testing the effect of caustic soda on skin and cloth	Diagram to explain corrosive nature of base		
Acquires skill to prepare slaked lime,	4.2.5 Preparation of slaked lime from Quick lime.	The Process of preparation of slaked lime from quick lime is explained	Chemical equation.	How slaked lime is prepared from quick lime?	
Distinguishes between acids and bases.	4.2.6 Differences between acids and bases	Tabulating the differences between acids and bases.	Chart	Enumerate the differences between acids and bases	1
Recalls some common salts	4.3 Salts.	Common salts in different forms- food, fertilizers.		Mention the salts used in our daily life.	
Acquires knowledge about preparation of salts by neutralisation.	4.3.1 Salt formation by neutralisation reaction	concept of neutralisation is explained with examples.	Chemical equations of some neutralisation reactions	What is neutralisation?	
Acquires knowledge about preparation of simple salts.	4.3.2 Preparation of simple salts.	Formation of sodium chloride, potassium chloride, calcium chloride. zinc sulphate; copper sulphate, ammonium chloride.	Chemical equations	What are simple salts? Explain their properties. Mention the change that takes place when copper sulphate crystals are heated.	5
Recognises the completeness of neutralisation.	4.3.3 Partial neutralisation of an acid by a base- acidic salt .Partial neutralisation of a base by an acid- basic salt.	Examples for acidic salts and basic salts, baking soda, bleaching powder.		Explain the differences between acidic and basic salts.	

Realises the uses of salts.	4.3.4 Uses of salts	Listing the uses of salts in food, Medicine,fertilizers etc.			
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SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 5 - HEAT - 16 PERIODS

1	2	3	4	5	6
Recalls heat as a form of a energy. Identifies sources of heat energy.	5.1 Heat-sources of heat energy	Explains the sources of heat energy.	Demonstrates the heat produced while rubbing hands. Lists out fossil fuels and their uses in daily life.	Name the sources from which heat energy is obtained. Name the energy conversion in burning cooking gas, coal or wood.	1
Distinguishes between heat and temperature. Appreciates change in temperature due to heat	5.2 Heat and temperature - Effects of heat - change in temperature.	Illustrates that heat is the amount of energy and temperature is degree of hotness or coolness.	Explains why more heat energy is required to heat more quantity of a substance.	What is the standard unit of temperature? Note down the maximum and minimum temperature of your village during summer/winter.	1
Understands the expansion of matter due to heat	5.3 Effects of heat - Thermal expansion of solids	Demonstrates with simple experiments that solids expand on heating.	Explains why gaps are left between rails, concrete slabs in bridges.	Name some devices which use thermal expansion for their working	2
Analyses the thermal expansion of liquids.	Thermal expansion of liquids.	Illustrates the anomalous expansion of water and explains why fish can survive underneath ice in polar regions.	Analyses the expansion of water, kerosene, alcohol and coconut oil using specific gravity bottles and water bath.	Which of these liquids expands the most?	
Appreciates the effect of heat on living organisms	5.4 Effect of heat on living organisms	Explains how extreme temperatures in other planets do not support life and climatic control of life on earth	Lists out plants / animals peculiar to polar regions.	What are the effects of heat on living organisms?	1

1	2	3	4	5	6
Recognizes change of state by heating.	5.5 Change of state.	Explains change of state with examples. Heats an ice block to melt it into water and boils water to make it steam.	Lists out the freezing, boiling points of some common substances.	Explain the difference between boiling and evaporation. What is the melting point of ice and boiling point of water?	1
Appreciates the applications of the thermal expansion of liquids.	5.6 Thermometer - clinical thermometer	Explains the construction and working of a Mercury thermometer. Practices reading on the scale of the thermometer by immersing it in cold water and hot water.	Explains how the clinical thermometer differs from a laboratory thermometer. Measures the normal temperature of human body.	Why mercury is used in thermometer? What are lower and upper fixed points of the Celsius scale?	1
Understands the unit of heat	5.7 Units of heat energy	Defines calorie and joule	Lists out the calorific values of different fuels.	Name the units of heat energy	1
Understands heat capacity and specific heat capacity of substances	5.8 Heat capacity - specific heat capacity	Demonstrates the different substances have different heat capacities and specific heat capacities by heating equal mass of different liquids in test tubes placed in water bath.	Explains water is invariably preferred as a coolant.	Define specific heat capacity of a substance.	1
Understands the different modes of transmission of heat in solids, liquids and gases.	5.9 Modes of transfer of heat-conduction.	Demonstrates the conduction of heat by heating one end of a metal rod with drawing pins fixed with wax along its length.	Demonstrates heat conduction by heating one end of the needle with a lighted match stick and sensing the heat at the other end.	Why is the handle of a heating iron made of ebonite or wood?	1

1	2	3	4	5	6
Recognizes convection of heat in fluids.	Convection	Demonstrates convection of heat by covering a burning candle with a glass tube and placing a T-shaped cardboard at the upper end.	Demonstrates convection by the rotation of a circular foil pivoted on a needle and placed near a flame.	What is convection? How is heat conducted in air and Water?	1
Understands heat radiation	Radiation	Demonstrates heat radiation by comparing the temperatures of water in two cans, one of which is brightly polished and other coated with black.	Explains how a person standing near a fire feels the heat of fire?	Why sun light is hotter while moon light is cooler? What do people prefer to wear white clothes in summer?	1
Distinguishes between conductors and insulators of heat	5.10 Conductors and insulators.	Lists out examples for good conductors and insulators of heat.	Observes the use of wooden/plastic handles in cooking vessel.	Why is handle of heating iron made of ebonite or wood?	1
Understands the functioning of thermos flask	5.11 Thermos flask	Identifies the different parts of thermos flask and their role in minimising heat transfer.	Illustrates the construction and working of thermos flask.	The steel chair appears cooler to touch than a wooden chair. Why? Why are the surfaces of thermos flask silvered?	1

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 6 - LIGHT - 12 PERIODS

1	2	3	4	5	6
Understands that light travels in straight lines	6.1 Rectilinear propagation of light - speed of light - Pinhole camera.	Demonstrates that light travels in straight lines. Explains the construction of pinhole camera.	Makes a pinhole camera and observes the nature of images. The sun is 1500 million km away from the earth. Calculate the time taken for sunlight to reach the earth.	What happens to the image, if the pinhole of the camera is enlarged? Explain the working of the pinhole camera.	2
Understands the cause of shadow formation Appreciates the formation of umbra and penumbra.	6.2 Formation of shadows - umbra and penumbra	Explains the shadow formation due to opaque objects. Explains shadows due to point and extended sources. Identifies umbra and penumbra. Moves the object towards the source and the screen and examines the size of umbra.	Places a piece of card with a small hole in it in front of the lamp and observes the image on a screen. Places a pencil/ball in the light beam and observes the shadows.	How are shadows formed? Why the shadows of opaque objects formed by extended sources appear blurred around the edges?	2
Reasons out that solar and lunar eclipses are due to shadows of moon and the earth	6.3 Eclipses - solar and lunar eclipses	Explains the formation of solar and lunar eclipses.	Demonstrates the formation of eclipses. Sets up a model using a large lamp for the sun, table tennis ball for the moon and foot ball for the earth. Uses the above apparatus to show the eclipse of the sun and moon.	Explain how solar and lunar eclipses occur. Which eclipse is seen much more often?	2

1	2	3	4	5	6
<p>Appreciates the reflection of light by mirror and smooth surfaces.</p> <p>Understands the laws of reflection of light.</p>	<p>6.4 Reflection of light - Reflection from regular and irregular surfaces. Reflection from plane mirror.</p> <p>Laws of reflection- image formed by a plane mirror.</p>	<p>Explains the reflection of light</p> <p>Explains angle of incidence, angle of reflection, incident ray, reflected ray and normal to reflecting surface.</p> <p>Demonstrates the characteristics of images formed by a plane mirror with examples.</p>	<p>Illustrates the reflection of light using plane mirror.</p> <p>Verifies the laws of reflection using plane mirror and pins.</p> <p>Observes the cover of a book in a plane mirror and explains why it appears laterally inverted.</p>	<p>What is the angle of reflection if the angle of incidence is 30??</p> <p>What is the size of the image and its nature in the plane mirror?</p> <p>Stand in front of the mirror and raise your right hand. Which hand appears to rise in the mirror?</p>	2
<p>Appreciates the uses of plane mirrors.</p>	<p>6.5 Uses of plane mirrors - periscope.</p>	<p>Explains the various uses of the plane mirrors in daily life.</p>	<p>Sees the object through the periscope and explains its working.</p>	<p>What are the uses of plane mirrors?</p>	1
<p>Analyses reflection by curved surfaces. Appreciates the uses of spherical mirrors.</p>	<p>6.6 Spherical Mirrors - Concave and convex mirrors - focal point - images formed by spherical mirrors for different positions of an object - uses of spherical mirrors.</p>	<p>Demonstrates the characteristics of spherical mirrors.</p> <p>Tabulates the nature of images formed by convex and concave mirrors for different positions of objects.</p>	<p>Observes the image through both sides of a bright spoon and comments on the results. Lists the uses of concave and convex mirrors.</p>	<p>What is the difference between concave and convex mirrors?</p> <p>What are uses of spherical mirrors?</p>	2
<p>Appreciates the role of light in photosynthesis</p>	<p>6.7 Effect of light on plants</p>	<p>Explains how sunlight is harvested by plants and used by other forms of life</p>	<p>Collects details on photosynthesis</p>	<p>How plants make their own food?</p>	1

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 7 - SOUND - 12 PERIODS

1	2	3	4	5	6
Understands that vibration causes sound	7.1 Vibration as a source of sound - amplitude, time period and frequency of vibration.	Demonstrates and explains vibrations which produce sound in bell, drum, flute and veena. Explains qualitatively amplitude, time period and frequency with a simple pendulum / tuning fork.	Lists out the nature of vibrations in musical instruments.	How is sound produced?	2
Distinguishes between audible and inaudible sound.	7.2 Audible and inaudible sound	Lists the frequency range of audible and inaudible sound	Observes the difference in pitch of sound produced by boys and girls.	What are the frequency ranges of audible and inaudible sound?	2
Recognizes that a medium is essential for sound propagation	7.3 Medium for propagation of sound	Demonstrates that medium is essential for sound propagation. Pumps out air from bell jar with electric bell inside to observe the lowering of sound intensity.	Identifies examples for propagation of sound in gases, liquids and solids.	Can you hear sound on the moon? What is the velocity of sound in air, water and iron?	2
Appreciates reflection of sound	7.4 Reflection of sound - echo	Demonstrates reflection of sound with tubes and bell.	Explores the uses of echoes	How are echoes produced?	2
Differentiates the velocities of sound and light	7.5 Lightning and thunder	Explains how lightning and thunder occur.	Gives illustrations to show that light travels faster than sound.	You hear a thunder 3 seconds after a lightning. How far away the lightning occurred?	1
Differentiates between music and noise.	7.6 Music and noise	Demonstrates that regular and periodic sound is music and irregular, non-periodic sound is noise.	Tabulates sources of music and noise. Identifies sources of noise pollution.	What are the harmful effects of noise pollution? How can we avoid noise pollution?	1
Appreciates the working of different types of musical instruments.	7.7 Musical instruments - string, air, percussion instruments.	Explains the nature of sound produced in veena, flute and drum.	Lists out how the pitch, intensity and quality of sound are varied in different musical instruments.	Explore the benefits of music in our life.	2

SCIENCE - PHYSICAL SCIENCE - STD VII - UNIT 8 - ELECTRIC CHARGES AT REST - 10 PERIODS

1	2	3	4	5	6
Appreciates the electrical nature of matter	8.1 Charged and uncharged bodies structure of atom, electron, proton and neutron.	Explains electrical nature of matter. Demonstrates charging of bodies by rubbing balloons with cloth and shows that they repel each other. Rubs a dry comb/plastic scale and shows that they attract tiny bits of paper.	Explains why hairs on hands repel one another and get attracted when we wear nylon clothes.	Name the type of charges on electron, proton and neutron. Why atoms of matter are neutral in nature?	2
Distinguishes positive and negative charges and understands the force between charges.	8.2 Types of charges - force between charges	Demonstrates positive and negative charges by charging glass and ebonite rods.	Observes repulsive forces between like charges and attraction between unlike charges.	Explain how are objects charged?	2
Understands the different methods of charging bodies	8.3 Charging of bodies by friction, contact and induction.	Demonstrates charging by friction, contact and induction.	Brings a charged body near a gentle stream of water from a tap and observes the electrical attraction.	Explain how charges are induced in bodies.	2
Understands lightning as an electrical discharge of the clouds.	8.4 Charging and discharge of clouds - lightning conductor	Explains the working of a lightning conductor.	Observes the lightning conductor in tall structures.	Who invented the lightning conductor? How does it work?	2
Analyses the working of an electroscope.	8.5 Simple electroscope	Describes the construction and working of a simple electroscope.	Observes how charges are detected using an electroscope.	What is an electroscope?	2