

CLASS-10
PHYSICAL SCIENCE
ANDHRA PRADESH SYLLABUS

LESSON PLANS



ENGLISH MEDIUM

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CLASS-10
PHYSICAL SCIENCE
LESSON PLAN
CHAPTER: 01 – HEAT

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Transfer of heat	1	4	Activity	Wooden piece, metal piece, ice box, A cup of coffee, a cup of tea	What are the properties of Solids?
	Thermal equilibrium			Activity	A cup of hot water, a cup of cold , water, laboratory thermometer	If A and B substances have same temperatures, can we say that they are in thermal equilibrium?
	Heat – Temperature - Units			Conversation	AV-clip about transfer of heat and thermal equilibrium	What are the units of heat in CGS system?
2.	Temperature –Kinetic Energy	4	5	Activity	One bowl of hot water, One bowl of cold water, food colour	What happened to the KE of molecules of a substance, if provide heat?
	Transfer of heat - Activity			Activity	Glass jar, Hot water, coconut oil, lid, two lab thermometers	What happened until thermal equilibrium takes place?
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3.	Different substances have different specific heats	5	8	Activity	Big glass jar, water, test tubes-2, rubber corks-2, two lab thermometers, retort stands-2	Which takes more time to raise 1°C ? either water or Ice ?
	Affecting factors of specific heat			Activity	Stove, Two beakers, water, 250 ml measuring jar, lab thermometer	What are the affecting factors of specific heat?
	Specific heat – formula - Units			Conversation	Chart	1 cal = Joules?
4.	Specific heat - applications	8	9	Activity	Watermelon/ apple and a potato, ice box, Samosa-2	A samosa appears cool out side. But it is hot inside. Why?
	Method of mixtures			Activity	Two beakers, large beaker, thermo meter, water, stove	20gm of water at 40°C mixed with 20 gm of water at 60°C . What is the final temperature?
	Law of thermal equilibrium			Conversation	AV-clip	What is the formula for finding final temperature in method of mixtures?
5.	Calorie meter – structure – working	*	*	Conversation	Calorimeter model and photos	What is called simple calorie meter?
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6.	Determination of specific heat of a solid	9	10	Lab Activity	Calorimeter, thermometer, water, hot water, solid shots (lead shots)	What is the specific heat of copper?
						What precautions can we take while finding the specific heat of solid in lab ?
7.	Evaporation - activities	10	12	Activity Conversation	Spirit, small dishes-2, lid-1, big plate, Match box	Is evaporation a cooling process? Or warming process?
						What is evaporation?
8.	Condensation	12	13	Activity	Glass tumbler, cold water	Give an example for condensation ?
	Humidity			Conversation	Chart	What is humidity?
	Dew , fog, mist			Activity	Glass tumbler, cold water, Long glass tumbler, Ice cubes	How fog is formed?
	Rain, snow.....			Activity	Steel tumbler, ice cubes, salt	Raining is condensation. Why?
9.	Boiling - activities	13	15	Activity Conversation	Beaker, stove, lab thermometer, chart	What is the difference between evaporation and boiling?
10.	Melting and freezing	15	17	Activity Conversation	Beaker, ice, stove, lab thermometer, Plastic bottle, water, ice box, Camphor, match box	What is freezing?
						What happened when a fulfilled glass water bottle kept in deep fridge?

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CHAPTER: 02 – CHEMICAL REACTIONS AND EQUATIONS

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Chemical reactions - Permanent, temporary change	20	22	Conversation	CaO, Water, Red litmus, Beakers-3, Na ₂ SO ₄ , BaCl ₂ , Test tube, Zinc pieces, Dil. HCl, Match box, Chart	What is the difference between physical and chemical change?
	Chemical reactions – Natural, manmade changes			Activity		Is burning of paper a chemical change? Why?
	Changes in chemical reactions			Conversation		What is the colour of Barium Sulphate?
2.	Writing of chemical equation	22	27	Conversation	Chart	Why should we balance chemical equation?
	Steps to balance chemical equation			Conversation		$2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ is it balanced? or not?
	Balancing chemical equations			Conversation		
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3.	Making chemical equation more informative	27	30	Conversation	Chart, Dil. HCl, Zinc granules, Beaker-2 AgNO ₃ , NaCl, Water,	What is the symbol used to denote precipitate in a chemical equation?
	Physical state, temperature difference, releasing gas			Conversation		↑ For which purpose we use this symbol in chemical equations?
	Interpretation a balanced chemical equation			Conversation		
	Chemical equations – calculations – problems			Conversation		
4.	Types of chemical reactions	30	34	Conversation	Chart, Spirit lamp, Magnesium, Tangs, MgO, Water, Red litmus, Beaker, CaO, NH ₃ , HCl, CaCO ₃ , Test tube, Match stick, Lead Nitrate, Broom stick, Silver bromide, Watch glass	How many types of chemical reactions are there?
	Chemical combination			Activity		What is meant by chemical reaction?
	Chemical decomposition			Activity		AB → A + B This equation represents
5.	Types of chemical reactions	34	37	Conversation	Zinc granule, Dil.HCl, Match box, CuSO ₄ , Iron nails-2, Test tubes-2, Water, AgNO ₃ , Two beakers Lead nitrate, KI, BaCl ₂ , Na ₂ SO ₄ , ZnSO ₄	What is the difference between displacement and decomposition reaction?
	Chemical displacement			Activity		What is the colour of Coppet sulphate?
	Chemical double displacement			Activity		Can Copper displace iron from iron sulphate?

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6.	Oxidation – Reduction	37	38	Activity	Cu- powder, China dish, Burner, Tripod, Glass tube, Copper Oxide, Hydrogen, Burner	What is oxidation?
	Oxidation agent – reduction agent			Conversation		What is the difference between oxidation and oxidizing agent?
7.	Effect of oxidation in daily life	38	40	Conversation	Photos, Chart	Give two examples for oxidation in daily life?
	Corrosion – corrosion of food and metals like iron			Conversation		What is rust?
	Corrosion – reasons – preventions			Conversation		Does gold be rusted?
8.	Some other effects of oxidation in daily life	41	41	Conversation	Photos, Chart	Is rancidity an oxidation process?
	Rancidity – reasons – preventions			Conversation		What are called anti oxidants?
	Precautions to be taken to preserve food material			Conversation		

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CHAPTER: 03 – REFLECTION OF LIGHT BY DIFFERENT SURFACES

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Reflection of light – Concepts	45	46	Activity	Torch light, transparent glass, wooden plank piece, oily paper, plane mirror	Differentiate between shadows and images?
	Pin hole camera			Activity	Two cylindrical barrels with different radii, thick black paper or chart paper, thin white paper, needle, rubber bands, coconut oil drops	What is the property of image in pin hole camera? Is the size of image in pin hole camera big or small or same size?
2.	Nearest distance for light reflection	46	48	Conversation	Chart	What is Fermat principle?
	Finding the images formed by Mirror - Activity			Activity	Plane mirror	On which principle that a mirror works?
3.	Reflection of light by plane mirrors	48	50	Lab Experiment	Thermocole sheet, plane mirror, wooden cube (block), bell pins-8, white papers-4	What are the laws of reflection?
	Angle of incidence, reflection- Plane of reflection			Lab Experiment		Is angle of incidence is equal to angle of reflection?
	Laws of reflection			Lab Experiment		
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4.	Formation of image by plane mirror	50	52	Activity	Thermocol sheet, plane mirror, wooden cube (block), bell pins-8, white papers-4, Chart	What are the properties of image formed by plane mirror?
	Characteristics of image			Conversation		Is the image formed by plane mirror laterally inverted?
	Size, Distance – lateral inversion			Conversation		
5.	Reflection of light by spherical mirrors	52	54	Activity	Foam piece of 6x2 cm, pencils-5	What is called converging beam of light rays?
	Radius of curvature, Principal axis, pole			Activity	Ball, cutter, pencil	What is C for a spherical surface?
	Parallel beam of rays			Activity	Wooden block, iron nails-2, candle, match box	What is principal axis of a spherical mirror?
6.	Reflection of light by Concave mirror –ray diagram	54	55	Conversation	Chart. Video that shows the ray diagrams of concave mirror and convex mirror	What is the difference between convex and concave mirror?
	Reflection of light by Convex mirror –ray diagram			Conversation		What is focus of a spherical mirror?
7.	Reflection of light by spherical mirrors	55	57	Lab experiment	V-stand, concave mirror, Candle, match box, meter scale or long tape, white screen	If object is placed at C of concave mirror, then the image will form at
	Distance of object and image			Lab experiment		What is the relation between R and f ?
	Size of object and image			Lab experiment		

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8.	Ray diagram for reflection in concave mirror	57	61	Conversation	Chart	Which mirror forms real and virtual images?
	Place of object and place of image			Conversation		Which mirror is used by dentists?
	Real and virtual images			Conversation		
9.	Ray diagram for reflection in convex mirror	61	62	Conversation	Chart	Which mirror forms always diminished images?
	Place of object and place of image			Conversation		Which mirror is used as rear view mirror?
	Real and virtual images			Conversation		
10.	Derivation of formula for curved mirrors	62	64	Conversation	Chart	What is the mirror formula?
	Sign convention to the mirror formula			Conversation		Is the focal length of concave mirror positive?
						From which point the distances be measured for mirrors?
11.	Mirror magnification formula	64	65	Conversation	Chart	What is the magnification formula for a mirror?
12.	Archimedes story & Making of solar cooker	65	66	Conversation & Activity	Chart, Photographs related to Archimedes, video of Archimedes and solar cooker	Where should be the vessel kept in a solar cooker?

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CHAPTER: 04 – ACIDS , BASES AND SALTS

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Acids and Bases	69	70	Conversation	HCl, H ₂ SO ₄ , HNO ₃ , CH ₃ COOH, NaOH, KOH, Mg(OH) ₂ , NH ₄ OH, Ca(OH) ₂ , Blue litmus paper, Red litmus paper, Methyl orange solution, Phenolphthaleine solution, Test tubes-10, water, spatulas-5, watch glasses-10 (as per need)	What is called an indicator?
	Chemical properties of acids and bases			Activity / Lab Experiemnt		What is result for the test between blue litmus with acid? How can we use methyl orange indicator? Name some acid base indicators?
2.	Olfactory indicators	70	71	Activity	Cloth pieces, Onion pieces, ice box/fridge, HCl, NaOH, H ₂ SO ₄ , KOH, Clove oil, Venilla essence, Test tubes-4, Test tube holder	What are olfactory indicators? How can you use clove oil to identify acid or base?

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3.	Reactions of acids and bases with metals	71	72	Lab Experiment	Zinc granules, Dil. HCl, Test tube, Match box, Single holed rubber cork, Celine pipe with needle	How can we determine hydrogen?
4.	Reactions of acids with carbonates	73	73	Lab Experiment	Test tubes-2, Sodium Carbonate, Sodium bi carbonate, Dil. HCl, Rubber cork with one hole, Delivery tube, Lime solution	Which gas will liberate when carbonates reacts with acids?
	Reactions of acids with bicarbonates			Lab Experiment		What is the determination test for Carbon dioxide?
5.	Neutralisation reactions	74	74	Activity	HCl, NaOH, Phenolphthale solution, Conical flask, droppers-2, Antacid tablets, Litmus papers	What is neutralization reaction?
	Antacid tablet			Activity		Why do we use antacid tablets?
6.	Reactions of metal oxides with acids	74	75	Activity	CuO, HCl, HNO ₃ , CaO, Ca(OH) ₂ , Beaker-2, Test tubes-2, Test tube holder, Water	Name any two metal oxides?
	Reactions of non metal oxides with bases			Activity		Is non metal oxide an acid or a base?
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7.	Common properties of acids	75	77	Activity	Beaker, Water, HCl, H ₂ SO ₄ , NaOH, KOH, Glucose, Alcohol, Connecting wires, 5V LED bulb, 9V battery, Graphite rods-2	What are the properties of acids?
	Common properties of bases			Activity		
8.	Reaction with water (acids and bases)	79	82	Activity	Water, beakers-2, HCl, NaOH, P ^H papers, P ^H scale, different substances to test P ^H values	What is the use of P ^H ?
	Strength of Acids and bases			Conversation		Are salts are neutral?
	P ^H values of substances			Conversation Activity		Is identifying P ^H values of substances useful?
9.	Importance of P ^H in daily life	82	84	Conversation Activity	Chart, Substances like soil, P ^H paper, water, beaker	How can our tooth start decay?
10.	Salts and types	84	86	Conversation	P ^H paper, litmus papers, NaCl, KCl, NH ₄ Cl, Na ₂ CO ₃ , NaHCO ₃ , CuSO ₄ and other available salts, beakers-2, water	Are all salts neutral?
	P ^H Values of salts			Conversation Activity		What is a salt?
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11.	Preparation of bleaching powder- uses	86	88	Conversation	Chart, videos of preparation of bleaching powder, washing soda and baking soda	What are the uses of bleaching powder?
	Preparation of Baking soda- uses			Conversation		Chemical name of washing soda?
	Preparation of washing soda- uses			Conversation		Which is used in cakes while preparing them?
12.	Removing of water – Crystallisation	88	09	Activity	Test tube, Test tube holder, Copper sulphate, Spirit lamp, water, spatula, POP, Chart	Name some substances having crystallization of water?
	Plaster of paris – manufacturing process			Conversation		What is the colour of anhydrous copper sulphate?

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CHAPTER: 05 – REFRACTION OF LIGHT AT PLANE SURFACES

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Refraction of light	93	96	Activity	Water, Glass tumbler, Pencil, Glass rod, Coin, Metal rod, Glass tub or plastic tub, Chart, Videos related to refraction	What is meant by refraction?
	Refraction – explanation			Activity		Why the pencil kept in water seems bent?
	Fermat's formula			Conversation		What is rarer medium?
	Angle of incidence – angle of refraction			Conversation		
2.	Refractive index	96	97	Conversation	Chart, Videos related to refraction	What is relative refractive index?
	Refractive indexes of some material media			Conversation		Which is optical denser medium ?
	Affecting factors of refractive index			Conversation		Either kerosene or water?
	Relative refractive index			Conversation		What is the refractive index value of water?
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3.	Relation between angle of incidence and refraction	97	99	Lab Experiment	Plank, White chart, Protractor, Small black painted plank, semi circular glass slab, pencil, laser light	What happened when light ray travels from rarer medium to denser medium?
	Rarer media – denser media			Activity	Water tub, water, circular disc. Marker pen, scale, straw, pin, protractor	If refractive index is more then the velocity of light in that medium is ..?
4.	Refraction – Snell’s law	99	102	Conversation	Chart, Video relates to Snell’s law	What is snell’s law?
						What does snell’s law tell?
5.	Total internal reflection	102	104	Activity	Water glass, water, coin	What are the conditions for TIR?
	Critical angle			Activity	Glass bottle, Water, Dettol, Dhoop stick, Match box, Laser light	What is critical angle?
	Critical angles of rarer and denser medias			Activity	Plank, White chart, Protractor, Small black painted plank, semi circular glass slab, pencil, laser light	What is the difference between reflection and total internal reflection?

6.	Total internal reflection – Examples	104	105	Conversation	Chart, Videos related to mirages, Optical illusions	What is a mirage?
	Optical illusions - mirages			Conversation		Can we take the photograph of a mirage?
7.	Total internal reflection – applications	106	106	Conversation	Chart, Videos related, Optical fibers electrical model (Show item)	What is the refractive index of diamond?
	Brilliance of diamonds			Conversation		What are the uses of TIR?
	Optical fibers			Activity		Why the diamond shines more than a glass piece?
8.	Refraction through a glass slab	106	108	Lab Experiment	Drawing board, Chart paper, Drawing pins, Bell pins, Pencil, Scale, protractor, Glass slab,	What is meant by shift?
	Relation between angle of incidence and shift			Lab experiment		What is a glass slab?
9.	Refraction through a glass slab	108	109	Conversation	Drawing board, Chart paper, Drawing pins, Bell pins, Pencil, Scale, protractor, Glass slab, Chart	What is vertical shift?
	Finding refractive index of glass slab			Activity		What is the formula for refractive index of the glass slab?

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CHAPTER: 06 – REFRACTION OF LIGHT BY CURVED SURFACES

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Refraction of light at a curved surface	112	115	Activity	Glass tumbler, Water, Paper, Sketch pen	Is Snell's law applicable for refraction at curved surfaces ?
	Refraction through convex, concave surfaces			Activity	Convex lens, Concave lens, Red laser pen, Green laser pen	What is focus of a curved surface ?
	Refraction through rarer and denser mediums			Activity	Red and green laser pens, Transparent tub with curved division in it, Dettol, Water	What is principal axis ?
2.	Refraction – image formation	115	117	Activity	Glass tumbler, Water, Lemon, Specimen potter, Watch glass, Egg, Chart	What is the formula for refraction at curved surfaces ?
	Refraction – image formation Formula Derivation			Conversation		What is the radius of curvature for plane surfaces ?
	Relation between the distances of object, image and radius of curvature			Conversation		What is the formula for refraction at plane surfaces ?
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3.	Refraction on curved surfaces - problems	117	119	Conversation	Chart	Is the flying bird appears nearer or distant for a man swimming in water ?
4.	Lenses – types – main terms and concepts	119	121	Activity	Bi convex lens, Bi concave lens, Plano convex lens, Plano concave lens, Convexo concave lens	Is bi convex lens a convergent lens ?
	Focal length of a lens			Activity	V-stand, Convex lens, Long scale or Tape, Screen	What is focal length of a lens ?
5.	Behaviour of light rays on lens	121	122	Conversation	Chart, Model of behavior of rays with broom sticks	If light ray incident parallel to the axis, what is the refracted ray path ?
						What is the difference between convex lens and concave lens ?
						Is $R = 2f$ true for lenses ?
6.	Ray diagram of forming image by lens	122	124	Conversation	Chart, Animated video for ray diagrams	If light ray incident through the focus, what is the refracted ray path ?
	Places of images by refraction through convex lens			Conversation		

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7.	Ray diagram of forming image by lens	124	125	Conversation	Chart, Animated video for ray diagrams	If light ray incident through the optic center, what is the refracted ray path ?
	Places of images by refraction with concave lens			Conversation		If light ray incident along the axis, what is the refracted ray path ?
8.	Experiment with convex lens	125	126	Lab experiment	V-stand, Convex lens, Candle, Match box, Long scale or Tape, Screen	How can you determine the focal length of a convex lens ?
	Determination of places of images for different distances of objects			Lab experiment		Can you determine the focal length of a concave lens ?
9.	Lens formula - Derivation	127	129	Conversation	Chart	What is Lens formula ?
10.	Affecting factors of focal length	129	131	Activity	Lens holder, Convex lens, Water, Stone, 50 cm height transparent tumbler	What happened to the focal length of a lens if we kept it in water ?
	Lens maker's formula Derivation			Conversation		What is Lens maker's formula ?
11.	Lens maker's formula - problems	131	131	Conversation	Chart	Find the refractive index of symmetric convex lens material if $f = R$.

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CHAPTER: 07 – HUMAN EYE AND COLOURFUL WORLD

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Least distance of distinct vision	135	137	Activity	Stand, Wooden scales-2, Thread, A book	What is least distance of distinct vision ? Vamsi is 6 years old. Can he able to see objects kept at 15 cm before her eye ?
2.	Structure of human eye	138	140	Activity	Human eye model, Video clips,	What is accommodation ?
	Focal length of eye lens			Conversation		Maximum focal length of eye lens ? Minimum focal length of eye lens ?
3.	Common defects of vision	140	142	Conversation	Chart, Video clips	Do you have an eye problem ?
	Myopia			Activity	V-stands-2, Screens-2, Convex lens, Concave lens, Candle, Match box, Sketch pen, White papers-4	If the object kept beyond far point, Arun is unable to see it. Identify his eye defect ?
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4.	Common defects of vision	142	144	Conversation	Chart, Video clips	Do you have an eye problem ?
	Hypermetropia			Activity	V-stands-2, Screens-2, Convex lens -2, Candle, Match box, Sketch pen, White papers-4	If the object kept before near point, Varun is unable to see it. Identify his eye defect ?
	Presbyopia – Power of lens			Conversation	Chart, Video clips	The focal length of a lens is 25 cm. What is the power of that lens ?
5.	Dispersion – scattering	145	145	Activity	Transparent plastic tub, Water, Dettol, Red and green laser pens, Glass prism	What is dispersion ?
	Prism – angle of deviation			Activity		What is scattering ? Why we can't see seven colours in glass slab while refraction ?
6.	Finding angle of deviation of prism	146	147	Lab experiment	Thermocole sheet, Glass prism, Drawing pins-4, Alpins -4, A4 paper-1, Scale, Protractor, Pencil, Graph sheet	How can you determine the refractive index of a prism material ? What is angle of minimum deviation when a light refracted from a glass prism?
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7.	Finding refractive index of prism	147	149	Conversation	Chart	What is the formula for refractive index of the material of a prism ?
	Problems			Conversation		A=60°, D=30° then find the refractive index of prism?
8.	Colours deviation	149	151	Activity	Plastic tray, Water, Plane mirror, White paper, Torch light (powerful white light)	Name the colours in rain bow ?
	Dispersion			Conversation		What is dispersion ? What is the difference between dispersion and scattering ?
9.	Dispersion of light	151	153	Conversation	Chart, Video clips	What is the difference between dispersion and scattering ?
	Rain bow formation - principle					Which processes takes place while formation of rain bow in water drop ?

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10.	Scattering of light	154	155	Activity	Charts, Video clips	Why sky appears blue ?
						What is the colour of sky when it is so hot ?
11.	Dispersion and scattering and Applications	155	156	Activity	Beaker, Hypo, Sulphuric acid, Video clips	Why sun is red in colour in the mornings ?
						How sun appears in noon time ?

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CHAPTER: 08 – STRUCTURE OF ATOM

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Atomic model	160	160	Conversation	Chart, Video clips	What is an atomic model ?
	J.J.Thomson, Rutherford, Bohr's model			Conversation		What is the main theme in Thomson's model of atom ?
						Who stated Planetary model of atom ?
2.	Spectrum	161	162	Conversation	Chart, Video clips of Electro magnetic wave, Electro magnetic spectrum	What is the speed of light ?
	Wave nature of light			Conversation		What is an Electro Magnetic Wave ? (EMW)
	Electro magnetic waves – properties			Conversation		What are the colours present in Visible spectrum ?
	Visible spectrum			Conversation		Which colour has more wave length ?

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3.	Electro magnetic spectrum	162	164	Conversation	Chart, Video clips of Electro magnetic wave, Electro magnetic spectrum, Absorption spectrum, Emission spectrum, Line spectrum, Band spectrum, Continuous spectrum	What are the colours present in Visible spectrum ?
	Electro magnetic waves – types – Explanation			Conversation		Planck's equation ?
	Plank's constant			Conversation		
	Colours released by atoms of elements			Activity		Cupric chloride, Hydrochloric acid, Platinum loop, Spirit burner, Match box
4.	Bohr's model of Hydrogen atom	164	166	Conversation	Chart, Video clips	How many sub shells present in second orbit ?
	And its limitations					What is micro spectrum ?
	Bohr – sommerfeld atomic model					
5.	Max Planck	166	167	Conversation	Chart, Video clips	What is uncertainty principle ?
	Quantum mechanical model of atom			Conversation		How many quantum numbers are there ?
						What is called an orbital ?
						Is it possible to find the exact position of electron ?
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6.	Quantum numbers (n, l, m, s – Numbers)	167	170	Conversation	Chart, Video clips	Which quantum number indicates the shape of sub shell ?
	Shapes of s, p, d, f orbitals			Activity	Empty water bottles, Glue, Broom sticks (OR) Clay, Water, Broom sticks (OR) Balloons, Plaster, Broom sticks	What is the shape of p- orbital ? How many d-orbitals are there ?
7.	Electronic configuration	170	172	Conversation	Chart, Video clips (Play way method to awareness)	What is nl^x method ?
	Pauli's exclusion principle			Conversation		What is the maximum number of electrons that can be accommodated in an orbital ?
	Aufbau's principle			Conversation		Which orbital has least energy ?
8.	Moeller's diagram	172	173	Conversation	Chart, Video clips (Play way method to awareness)	What is the main observation from Moeller's diagram ?
	Hund's rule			Conversation		State Hund's rule ?
	Electronic configurations of elements			Conversation		What is the configuration of Sodium (Z=11) ?

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PHYSICAL SCIENCE
LESSON PLAN
CHAPTER: 09 – CLASSIFICATION OF ELEMENTS – THE PERIODIC TABLE

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Ordered arrangement of elements	176	178	Conversation	Chart, Photographs PPT of ordered arrangement like medical shops, cloth centers clips, Departmental stores	Who named the term element at first?
	Dobereiner's law of triad			Activity Conversation		Who classified the elements first? Name any two dobereiner's triads? X, Y, Z are triads. Atomic masses of X and Z are 32, 125. Then Atomic mass of Y is ?
2.	Newland's law of octaves	178	180	Conversation	Chart, Video clip on Newlands octaves, PPT of ordered arrangement like medical shops, cloth centers clips, Departmental stores	What is the basis for classification of elements made by Newlands?
				Conversation		What are the limitations of Newlands octave theory?
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3.	Mendeleeff's periodic table	180	184	Conversation	Chart, Video clip on Mendeleeff's periodic table, Photographs of different tables made by Mendeleeff	What is the Mendeleeff's periodic law?
	Mendeleeff's periodic law			Conversation		How many periods are there in Mendeleeff's periodic table?
	Limitations of Mendeleeff's periodic table			Conversation		What is the name of element which was named in the honour of Mendeleev ?
4.	Modern periodic table	186	186	Conversation	Chart, Videos on Modern periodic table	What is modern periodic law of elements?
						Who created modern periodic table?
						How many groups in Modern periodic table as per IUPAC?
5.	Modern periodic table	184	186	Conversation	Chart, Magnetic board of Periodic table	How many blocks are there ?
	Places of elements in periodic table			Conversation		In which group do inert gases placed?
	Blocks in modern periodic table			Conversation		What are the majority category of elements? Either metals or non metals?
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6.	Groups in Modern periodic table	187	188	Conversation	Chart, Magnetic board of Periodic table	Which group elements are called Alkali metals?
						Why do Oxygen family called as Chalcogens?
						What is the General valency of Inert gases?
7.	Periods in Modern periodic table	189	190	Conversation	Chart, Magnetic board of Periodic table	Which is the shortest period?
						Which is the longest period?
						How many elements are present in third period?
8.	Metals and Non metals	190	193	Conversation	Chart, Magnetic board of Periodic table, Video clip on Change of properties of elements in Modern periodic table	Name any two metalloids?
	Properties of elements			Conversation		How many meters make a Pico meter?
	Trends in groups and in periods of periodic table			Conversation		How does the atomic radius changes from left to right in a period of modern periodic table?
	Changes in valence & Atomic radius			Conversation		Which has more atomic radius either Oxygen or Fluorine ?

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9.	Changes in Ionisation energy in Periodic table	193	195	Conversation	Chart, Magnetic board of Periodic table, Video clip on Change of properties of elements in Modern periodic table	What are the affecting factors of Ionisation energy?
	Affecting factors of Ionisation energy			Conversation		The energy released when an electron introduced in an atom is ?
	Changes in Electron affinity in Periodic table			Conversation		What happened to ionization energy when Atomic size increases?
10.	Electro negativity –changes in periodic table	196	196	Conversation	Chart, Magnetic board of Periodic table, Video clip on Change of properties of elements in Modern periodic table	Which element has the greatest electro negativity value?
	Metallic and non metallic properties			Conversation		Is non metallic property increases from top to bottom in a group? Name any two best metalloids? Which element has the least electro negativity value?

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CHAPTER: 10 – CHEMICAL BONDING

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Chemical bond	202	204	Conversation	Charts, Video clips about chemical bond basics and Davy's experiment	Why do elements participate in chemical bonds ?
	Octet configuration			Conversation		What is meant by Octet electron configuration ?
	Davy's experiment			Conversation		Which can participate in chemical bonds ?
2.	Lewis symbols	204	206	Conversation	Charts, Video clips about Lewis notation	How many valence electrons present in Sodium ? Which inert gas has no Octet configuration ? How can we write Carbon in Lewis dot structure ?

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3.	Electronic theory of valence by Lewis and Kossel	206	208	Conversation	Charts, Video clips about Lewis notation and Kossel theory	If an atom gain electrons, it will convert to ? What is a cation ?
4.	Ionic Bond NaCl, MgCl ₂ ,	208	212	Conversation	Charts, Video clips about Ionic bond and Structure of Sodium chloride	What is a Crystal ? How MgCl ₂ molecule is formed ? Which bond present in AlN ?
5.	Arrangement of ions in Ionic compounds	212	213	Conversation	Charts, Video clips about Ionic bond and properties of Ionic compounds	What are the affecting factors of Ionic bond ?
	Affecting factors of formation of Ionic bond			Conversation Conversation		Who introduced Ionic bond ? The bond between cation and anion is called as?
6.	Covalent Bond H ₂ , O ₂ , N ₂ , CH ₄ , NH ₃ , H ₂ O ,....	213	216	Conversation	Charts, Video clips about covalent bond and Structure of molecules	What is meant by covalent bond ?
				Conversation		How CO ₂ molecule is formed ?
7.	Bond length – Bond energy	216	217	Conversation	Charts, Video clips about covalent bond and bond energy	What is Bond energy ?
	Draw backs of Electronic theory of valence			Conversation		What is the bond angle in water molecule ?
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8.	VSEPR Theory BeCl ₂ , BF ₃ , CH ₄ , NH ₃ , H ₂ O,.....	217	220	Conversation	Charts, Video clips and Atomic model set with sticks and balls	What is the shape of BeCl ₂ molecule ?
				Activity		Name a molecule having pyramidal shape ?
9.	Valence bond theory	220	221	Conversation	Charts, Video clips and Atomic model set with sticks and balls	Difference between sigma bond and pi bond ?
	Overlap of s and p orbitals					How many sigma bonds present in Nitrogen molecule ?
	Sigma bond and pie Bond H ₂ , HCl, Cl ₂ , N ₂ , O ₂ ,.....					What is a double bond ?
10.	Valence bond theory	221	224	Conversation	Charts, Video clips about hybridisation	Which hybridization exist in Methane molecule ?
	Hybridisation BeCl ₂ , BF ₃ , NH ₃ , H ₂ O,.....					Name one molecule having Sp ² hybridisation ?
						What is the bond angle if there is sp hybridization ?
11.	Properties of Ionic and Covalent compounds	224	225	Conversation	Charts	Which have more boiling points ? either Ionic or covalent molecules?

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PHYSICAL SCIENCE
LESSON PLAN
CHAPTER: 11 – ELECTRIC CURRENT

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Electric circuits – conductors – insulators	228	230	Conversation	Chart, Video clips of Lorentz and Drude theory	What is the difference between conductors and insulators ?
	Electric current - units			Conversation		What is the unit for electric current ? What is the formula for calculate Electric Current ?
2.	Direction of electrons – drift speed	230	232	Conversation	Conversation	What is meant by drift speed ?
	Direction of electric current			Conversation		How can we say that the opposite direction of electrons is the direction of current ? What is the charge of electron ?
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3.	Potential difference – formula – units	232	235	Conversation	Charts and Video clips for Potential difference	What is Potential difference ?
	Derivation of formula for voltage difference			Conversation		What are the units for Potential difference ?
	Working of battery			Conversation		
4.	Electro motive force	235	236	Conversation	Charts and Video clips for e.m.f.	Is e.m.f. possessed by a battery ?
	Connection of batteries – connections of bulbs			Conversation		What is meant by series connection of batteries ?
5.	Ohm’s law - experiment	236	238	Lab Experiment	1.5 V dry cells-5, Wire, Volt meter, Ammeter, Iron spoke of 10 cm, LED, Plug key	How should an Ammeter connect in the circuit ? What do you understand about Ohm’s law ? Is LED obey Ohm’s law ?
6.	Ohm’s law – limitations	238	240	Conversation	Chart	What are Ohmic conductors ?
	Ohmic and non ohmic conductors			Conversation		What is the shape of graph between V and I for non ohmic conductors ?
	Resistance , resistivity- Electric shock -			Conversation		
	Multimeter			Activity	Multimeter	What is the use of multimeter ?
	Ohm’s law – limitations			Conversation	Chart	
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7.	Factors that affect resistance	240	243	Conversation	Chart	What are the affecting factors of resistance ?
	Nature of the substance			Activity	1.5 V dry cells-5, Wire, Ammeter, Iron spoke of 10 cm, Aluminium spoke of 10 cm, Plug key	How nature of substance affect the resistance ?
	Temperature			Activity	Iron spoke of 10 cm, Hot Iron spoke of 10 cm	What is the relation between temperature and resistance ?
	Length			Activity	Iron spoke of 10 cm, Iron spoke of 20 cm	If you take 20 cm gold wire and 40 cm gold wire, Which has more resistance ? Can you guess?
	Area of cross section			Activity	Iron spoke of 10 cm, Iron spoke of 10 cm with more thickness	
8.	Specific resistance – formula – units	243	243	Conversation	Chart	What are the units for resistivity ?
	Specific resistance – affecting factors			Conversation		What is difference between resistance and resistivity ?
	Specific resistance values for various materials			Conversation		
	Resistivity - applications			Conversation		
9.	Electric circuit	244	245	Activity	Chart, 1.5 V dry cells-5, Wire, Ammeter, volt meter , bulb, Plug key, three resistances	What is an electric circuit ?
	Series connection of resistances-resultant resistance			Activity		What is the use of ammeter in an electric circuit ?

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10.	Electric circuit	246	247	Conversation	Chart, 1.5 V dry cells- 5, Wire, Ammeter, volt meter , bulb, Plug key, three resistances	What is the resultant resistance if three resistors of 2 Ohm are connected in parallel ?
	Parallel connection of resistances-resultant			Activity		
11.	Kirchhoff's law's (Junction & loop law)	247	248	Conversation	Chart and Video clips about Kirchhoff's laws	What is Kirchhoff's Junction law ? What is a loop law ?
12.	Electric power	248	251	Conversation	Chart	What is the formula for electric power ? The unit of electric power consumption in houses is called ?
	Over load – Danger - Precautions			Conversation		What is the use of Fuse in house hold circuits ?

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LESSON PLAN
CHAPTER: 12 – ELECTRO MAGNETISM

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Electro magnetism –Oersted	258	259	Conversation	Wooden plank, Battery, Copper wire, Plug key, Compass	What is electro magnetism ?
	Oersted's experiment			Activity		What is the main theme of Oersted's experiment ? What are the apparatus needed to perform Oersted's experiment ?
2.	Magnetic field –Activity	260	262	Activity	Bar magnet, A4 sheet, Iron fillings, Magnetic Compass-4	What is a Magnetic field ?
	Direction of magnetic field, strength			Activity		What are magnetic lines of forces ?
	Magnetic lines of force			Activity		Are Magnetic lines curved ?
3.	Uniform , non uniform magnetic fields	262	263	Conversation	Chart and Video Clips of Flux	What is the unit of Magnetic Flux ?
	Magnetic flux – Magnetic field Induction			Conversation		What is Magnetic Flux density ?

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4.	Magnetic field due to current – Activity	263	264	Activity	Stand, Copper wire, Compass – 10, Battery, Plug key, Wooden weight	What is the shape of Magnetic field lines ?
	Right hand thumb rule			Conversation	Chart, Video clips	What is right hand thumb rule ?
5.	Right hand thumb rule	265	266	Conversation	Chart, Video clips	What is a solenoid ?
	Magnetic field due to circular coil			Activity	Wooden box, circular Copper wire, Compass, Battery, Plug key, Solenoid	How can you perform an activity to observe Magnetic field in a solenoid ?
	Magnetic field due to Solenoid			Activity		
6.	Magnetic force on moving charge and current carrying wire	266	268	Conversation	Chart, Video clips	What is CRT TV ?
						What is the formula for force on moving charge in a wire ?
7.	Time period of charged particle	268	270	Conversation	Chart, Video clips	In Right hand rule , the thumb indicates?
	Magnetic force on current carrying wire which is placed along a magnetic field			Conversation		In Right hand rule , the index finger indicates ...?
8.	Result force applied on a current carrying wire - Experiment	270	271	Activity	Wooden plank, Y – stands-2, Copper wire, Horse shoe magnet, Battery, Plug key	What are the apparatus needed for doing this activity ?
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9.	Electric motor – Principle and Working	271	273	Conversation	Chart, Video clips, Model of electric motor	What is the use of electric motor ? What is the principle of Electric motor ?
10.	Electro magnetic induction	273	275	Activity	Bolt, Copper wire, Ring magnet, no volt coil, Iron rod, Extension box	What is meant by induction ?
	Faraday's laws			Conversation	Chart, Video clips,	What do you know about Faraday's laws ?
11.	Electro magnetic induction	275	277	Activity	Copper wire, Bar magnet, Compass, Battery, Plug key	What is formula for induced e.m.f. ?
	Faraday's laws – Lenz's rule				Chart, Video clips,	What is Lenz law ?
12.	Conservation of energy – Faraday's laws	277	279	Conversation	Chart, Video clips,	What is law of conservation of energy ?
						What is the use of Galvanometer ?
13.	Induced Electro motive force – problems	279	280	Conversation	Chart, Video clips,	What are the applications of Faraday's laws ?
	Faraday's law of electro magnetic induction			Conversation		What are terms in $F = Bil$?
	and Its applications			Conversation		What are the terms in $\epsilon = Blv$?
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14.	Electric generator –	280	283	Conversation	Charts and Video clips of working of generator	What is the use of a generator ?
				Conversation		What is the difference between A.C. and D.C. ?
	A.C. and D.C. currents			Conversation		What is the difference between electric motor and electric generator ?

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CHAPTER: 13 – PRINCIPLES OF METALLURGY

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Metals – properties	286	288	Conversation	Chart, Video clips of Ores, Minerals and series of reactivity of metals	Name the ore of Aluminium ?
	Mineral – Ores			Conversation		What is the difference between mineral and ore ?
	Some ores and their formulas			Conversation		Which metals present in Carnallite ore ?
	Ores – metals present in the ores			Conversation		
	Reactivity of metals			Conversation		
2.	Steps involved in extraction of metal from ore	288	290	Conversation	Chart, Video clips of Concentration methods of ores	Which process is suitable for dressing of sulphide ore ?
	Concentration of ore – methods			Conversation		What are the main steps in extraction of metals from their ores ?
	(Hand picking, washing, froth floatation, magnetic separation)			Conversation		
				Conversation		What is gangue ?

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3.	Reactivity of metals	291	291	Conversation	Chart, Video clips of reactivity of metals	Which metal is highly reactive ?
	Reaction with oxygen, cold water, water vapour, strong dilute acids and chlorine			Conversation		Name two metals having very less reactivity ?
4.	Extraction of crude metal from the ore	292	294	Conversation	Chart, Video clips of reactivity of metals	Which method is suitable for extraction of Sodium metal from its ore ?
	Reduction of the ore to the purified metal as per the reactivity of the metal					Which is the main metal used in Thermite process ?
5.	Purification of crude metal – methods	294	295	Conversation	Chart, Video clips of purification of crude metals	What is distillation ?
	Distillation			Conversation		Which method is used to purify copper crude metal ?
	Poling			Conversation		What is electrolytic refining ?
	Liquation			Conversation		
	Electrolytic refining			Conversation		

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6.	Corrosion	296	297	Conversation	Chart, Video clips of corrosion Corroded articles like rusted Iron, Magnesium. And Copper with patina.	What is the colour of rust of Iron ?
						Name two metals which do not get rust ?
	Experiment – corrosion of iron			Activity	Test tubes-3, Water, Hot water, Oil, Iron nails-6, Rubber corks-3, Anhydrous CaCl ₂	What are essential factors for corrosion of Iron ?
	Preventive methods of corrosion			Conversation	Chart, Video clips of preventive methods of Corrosion	Name any two preventive methods for corrosion ?
	Alloys			Conversation	Chart, Video clips of Alloys and composition	What is the composition of Brass ?
7.	Important methods used in metallurgy	298	299	Conversation	Chart, Video clips of furnaces and their uses	What is smelting ?
	Smelting – blast furnace			Conversation		What is the difference between roasting and Calcination ?
	Roasting – calcinations			Conversation		What are the main parts in Furnace ?
	Reverberatory furnace			Conversation		
	Retort furnace			Conversation		

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LESSON PLAN
CHAPTER: 14 – CARBON AND ITS COMPOUNDS

PERIOD NUMBER	CONCEPTS / TEACHING POINTS	PAGES IN TEXT BOOK		TEACHING PROCEDURE	TEACHING LEARNING MATERIAL	EVALUATION
		FROM	TO			
1.	Carbon – valence – electron configuration - bonds	302	304	Conversation	Chart, Video clips about Carbon valency	What is the atomic number of Carbon ?
						How many valence electrons present in Carbon ?
						What is the Bond angle in Methane ?
2.	Promotion of electron – Hybridisation	304	308	Conversation	Chart, Video clips about Carbon valency and hybridisation	What is the excited configuration of Carbon ?
	sp^3 , sp^2 , sp hybridization(CH_4 , C_2H_4 , C_2H_2)			Conversation		Which hybridization takes place in Acetylene ?

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3.	Allotropes of carbon	308	309	Conversation	Chart, Video clips about allotropes of carbon	Name any two allotrope of Carbon element ?
	Amorphous, crystalline structures- Diamond			Conversation		What is the structure of molecules in Diamond?
4.	Structure of graphite - uses	309	310	Conversation	Chart, Video clips about allotropes of carbon	Why Graphite is used as lubricant ? Which hybridization present in Graphite molecules ?
5.	C ₆₀	310	312	Conversation	Chart, Video clips about allotropes of carbon	How many rings present in C ₆₀ ?
	Bukky balls			Conversation		What are uses of Nano tubes ?
	Nano tubes			Conversation		What is Graphene ?
6.	Versatile nature of carbon – wohler fredrich	312	314	Conversation	Chart, Video clips about catenation of Carbon	What is the first Organic compound prepared in Lab ?
	Catenation			Conversation		What do you understand by Catenation ? What is the valency of Carbon ?

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7.	Hydro carbons	314	315	Conversation	Chart	Which hydrocarbons are saturated ?
	Open and closed chains of hydrocarbons			Conversation		Which bonds present in Unsaturated hydrocarbons ?
	Saturated and unsaturated hydrocarbons			Conversation		What are Alkanes ?
8.	Binding of carbon with other elements	316	318	Conversation	Chart	How can we identify Alcohol functional group ?
	Functional groups			Conversation		How we call – COOH group ?
9.	Isomerism - homologous series	318	320	Conversation	Chart	What is isomerism ?
	Alkanes, alkenes and alkynes			Conversation		Is Methane shows isomerism ?
10.	Nomenclature of organic compounds	320	323	Conversation	Chart	What is the primary suffix for C=C ?
	Suffix and prefix of carbon atoms			Conversation		What is the secondary suffix for Aldehydes ?
	Names and formulas of organic compounds			Conversation		What is the word root for 6 carbons ?
11.	Numbering of carbon atoms – Compounds ,formulas	324	326	Conversation	Chart	Name the compound $\text{CH}_3\text{-CH=Ch=CH}_2$
						Write the structural formula for Butanal.
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12.	Chemical properties of carbon compounds	327	328	Conversation	Charts and video clips of chemical properties	Which gas liberate on combustion of Hydrocarbons ?
	Combustion, oxidation			Conversation		What is a catalyst ?
13.	Chemical properties of carbon compounds	328	329	Conversation	Charts and video clips of chemical properties	Why Alkanes participate in Addition reactions ?
	Addition and substitutions			Conversation		Which can participate in Substitution reactions ?
14.	Ethanol – manufacture – properties and uses	329	330	Conversation	Chart	What is the colour of Ethanol ?
						What is the use of Gasohol ?
15.	Acetic acid – preparation – uses -	330	332	Conversation	Chart	What is the formula of Acetic acid ?
	Esterification			Activity		Tripod, Beaker, Ethanol, Acetic acid, Wire mesh, Spirit lamp, Test tube, Match box

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16.	Soaps – saponification and micelles	333	334	Conversation	Chart	What is the difference between Saponification and esterification ?
	Formation of micelle			Activity	Test tubes-2, Oil, Water, Soap solution	What is a micelle ?
17.	Cleaning action of soap	334	336	Conversation	Chart, Animated video clips of Cleansing action of soap	What are hydrophilic and hydrophobic ends ?
						What is the shape of micelle ?
						How can a soap micelle remove dirt from clothes ?

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