Class 10

FORUM OF PHYSICAL SCIENCE TEACHERS TELANGANA

LESSON PLANS

Name: _____

School: _____

FORUM OF PHYSICAL SCIENCE TEACHERS
TELANGANA STATE

YEAR PLAN
PHYSICAL SCIENCES
10TH CLASS

Name of the teacher :

Name of the school :

Foreword

We are pleased to present this comprehensive material comprising Year Plans, Lesson Plans, and Period Plans developed by the **Forum of Physical Science Teachers, Telangana State.** This material has been thoughtfully prepared to serve as a valuable guide and support system for all Physical Science teachers across the state.

In the process of its development, we have drawn upon the expertise of subject experts, ensuring both academic rigor and practical classroom relevance. Every element of the material has been aligned with the SCERT Telangana guidelines, with a focus on competency-based education, experiential learning, and meaningful student engagement.

This initiative stems from our shared commitment to enhancing science teaching and learning. We believe that with proper planning and a structured approach. Physical Science Teachers can, not only achieve learning outcomes but also spark curiosity, scientific thinking and creativity among the students.

We hope this material empowers teachers to deliver Physical Science content with confidence, clarity, and creativity.

We have tried a lot to give this module error free but even it is found, bring to our notice. You need not to follow as it is, it is a model. You can change as per your feasibility. We look forward your kind suggestions to improve the module.

With best wishes from
Forum of Physical Science Teachers State Body
Telangana State

ANNUAL PLAN

1)	Class	:	X
2)	Subject	:	Physical Sciences
3)	Periods allotted for this subject per year	:	132

4) Academic standard

Conceptual Understanding:

- Explains reflection & refraction of light.
- Explains Formation of image by spherical mirrors& lenses.
- Explains Dispersion scattering of light and formation of rainbow.
- Explains and Relates between distance of object distance of image and focal length.
- Explains and Relates between distances of object distance of image and magnification of spherical mirrors and lenses.
- Explains and Relates between height of the object height of the image and magnification of spherical mirrors and lenses.
- Differentiate between concave and convex mirrors; concave and convex lenses; real and virtual image; Acids and bases;, Dispersion and scattering; Alkanes, alkenes and alkynes; Roasting and calcinations, etc.
- Explains the reflection and refraction dispersion and scattering of light phenomenon.
- Give reason for phenomenon of red colour of sun during sunset and sunrise; blue colour of sky; Rusting of metals ; Chemical bonding;
- Explains ionic, covalent bond with examples;
- Explains Bohr atomic theory and limitations; Dobereiner triads; Mendeleeff periodic classification and its limitations; Modern periodic classifications and laws: Influencing factor of resistance; working of electric motor& generator; role of slip ring in the motor; Cleansing action of soap, chemical reactions of Alkanes, concentration ore and extraction of metals from concentrated ore, Lenz law.
- Explains and calculates resultant resistance in parallel and series circuits.
- Explains, relates between physical quantities like current and charge and time and calculates.
- Explains, relates between physical quantities like F,L,B and calculates.
- Explain relates between the mass, mass relation, mass, volume relation calculates.

Asking questions and making hypothesis

- Children are able to ask questions to understand concepts, to clarify doubts about the concepts and to participate in discussions.
- They are able to guess the results of an issue with proper reasoning, able to predict the results of experiments.
- Predict the position and characteristics of the image when an object is placed at various points along the principal axis of mirrors and lenses.
- Form a hypothesis about the colour changes of indicators in solutions of acidic, basic, or neutral.
- Ask questions to understand the phenomena of reflection and refraction; Dispersion; scattering;
- Form a hypothesis about the colour changes of indicators in solutions of acidic, basic, or neutral acids reacts with metal & nonmetal and gas evolved; Angle of vision etc.

Experimentation and field investigation.

- Children are able to do the experiments and developed on their own; Experiments like Object is placed distinct positions on the principle axis of mirrors/lenses and formation of the image; acids/bases reacts with metal and evolves H_2 gas; Finding the refractive index of prism; verify the Ohms law; verify influencing factors of resistant; air and water is essential for rusting of iron articles etc.
- Able to arrange the apparatus, record the observational findings experiments like Object is placed distinct positions on the principle axis of mirrors/lenses and formation of the image; acids/bases reacts with metal and evolves H_2 gas; Finding the refractive index of prism; verify the Ohms law; verify influencing factors of resistant; air and water is essential for rusting of iron articles etc.
- Takes necessary precautions while doing the experiments like Object is placed distinct positions on the principle axis of mirrors/lenses and formation of the image; acids/bases reacts with metal and evolves H_2 gas; Finding the refractive index of prism; verify the Ohms law; verify influencing factors of resistant; air and water is essential for rusting of iron articles etc.
- Able to do alternate experiments by changing variables: Changing the position of object or different focal length lenses / mirrors.
- They are able to participate in field investigation and prepare reports on different types of defects of human eye by visiting a eye hospital/ophthalmologist nearby.

Information skills and Projects

- Children are able to collect information related to concepts using various methods (e.g., interviews, checklists, and questionnaires), analyze the data, and interpret the results.
- Through field investigations, students can visit a nearby eye hospital or ophthalmologist to gather information on different types of human eye defects, analyze the data, and prepare reports.

- Students collect different types of soil from their homes, farms, or school, test the properties of the soil, and analyze which types of plants can be grown in those fields.
- Students are able to conduct project work by collecting different types of vegetables and fruits, testing their properties, and drawing conclusions based on their findings.

Communication through drawing, model making

- Children are able to communicate their conceptual understanding by the way of drawing pictures labeling the parts of the diagram by drawing graphs, flow charts and making models.
- Draw ray diagrams to show the formation of images by mirrors and lenses.
- Draw diagrams showing the shapes of orbitals, molecules.
- Draw diagrams showing the experimental set ups like experiments like object is placed distinct positions on the principle axis of mirrors/lenses and formation of the image; acids/bases reacts with metal and evolves H_2 gas; Finding the refractive index of prism; verify the Ohms law; verify influencing factors of resistant; air and water is essential for rusting of iron articles etc.
- Draw the graphs to find the minimum deviation angle to find refractive index of prism; Draw the V and I graphs of Ohms law; Draw the graphs related to generator.

Appreciation and aesthetic sense, values

- Children are able to appreciate the nature and efforts of scientists and human beings in the development of science and have aesthetic sense towards nature.
- They are also able to follow constitutional values.

Application to daily life, concern to bio diversity.

- Children are able to apply the knowledge of scientific concept they learned, to solve the problem faced in daily life situations.
- Explain the applications of Faraday's law of electromagnetic induction used in daily life.
- Describe the applications of metal refining processes in everyday situations.
- Explain the effects of rusting and the preventive measures used in daily life.
- Apply scientific concepts in daily life to protect the environment.
- Demonstrate eco-friendly behavior in everyday activities.

Annual Plan – Class X Physical Science

Sl. No.	Month	Lesson/ Chapter Name	No. of Periods	Programs to be continued in CCE
1	June	Reflection of Light at Curved Surfaces	6	Lab activity-project work-Written works
2	June	Chemical Reactions	5	Project work-written works
3	July	Acids, Bases and Salts	9	Lab activity-project work-Written works Slip test-FA – 1
4	July	Refraction of Light At Curved Surfaces	9	Lab activity-project work-Written works Slip test-FA – 1
5	August	The Human Eye and the Colourful World	10	Lab activity-project work-Field trips Written works Slip test-FA – 2
6	August	Structure of Atom	7	Model making -project work- Written works Slip test-FA – 2
7	October	Classification of Elements and Periodic Table	10	Written works- Summative -1
8	October-November	Chemical Bonding	12	Model making -project work- Written works Slip test-FA – 3
9	November	Electric Current	10	Lab activity-project work-Written works
10	December	Electromagnetism	10	Lab activity-project work-Written works
11	December	Metallurgy	7	Lab activity-project work-Written works
12	January	Carbon and its Compounds	15	activities-project work-Written works-slip tests
13	February	Revision		Slip tests – Prefinal exams
14	March	Revision		Slip tests- Annual examination

6. Teacher' Reflection:

Name of the unit/lesson	Teacher's reflection	Signature of the teacher with date

Suggestions of Headmaster

Name of the unit/lesson	Teacher's reflection	Signature of the teacher with date

LESSON PLANS

Name of the lesson:1. Reflection of light by curved surfaces

Class :**10**

No. of periods required : 6

Academic Standards:

1. Conceptual Understanding:

- **Explains** spherical mirror and the terms used in it in own words; the mirror formula; characteristics of the image formed by the spherical mirrors; behavior of the rays that incidents on the spherical mirrors. ; Explains the need of paraxial approximation and gives reasons.
- **Gives reasons** the method of formation of images by a spherical mirror.
- **Differentiates** between: real image and virtual image; concave mirror and convex mirror.
- **Derives** mirror formula and apply to solve the problems.

2. Asking questions and making Hypothesis:

- **Predicts** the position of the image when object is placed at distinct positions on the principal axis of a spherical mirror.
- **Questions** about normal and its importance in spherical mirror.
- **Imagines** drawing normal to the concave mirror.

3. Experimentation- Field Investigation:

1. **Experiments:** To find out focal length of spherical mirrors; Observe the images if the object is placed at distinct positions on the principal axis of a concave mirror.
2. Follows the **precautions** during the experiment.
3. **Tabulates** the information and prepares reports.

4. **Concludes the result** of the experiment; Finds out focal length of spherical mirrors; Observes the images if the object is placed at distinct positions on the principal axis of a concave mirror;

4. Information skills and Project:

- **Collects** information on the impact of spherical mirrors in daily life. ; Collect the information about the uses of mirrors and prepare a report.
- **Analyzes:** the magnifications of the images formed by concave mirrors if the object is placed distinct positions on the principal axis of a concave mirror;the information about object distance and image distance, able to analyze the nature of the image.

5. Communication through drawing Pictures:

- **Draws**: ray diagrams; experimental set to observe the images formed by concave mirrors if the object is placed distinct positions on the principal axis of a concave mirror.
- Makes a solar cooker **model.**

6. Appreciation and aesthetic sense - values:

- **Respects** the efforts and method of finding mirrors.
- **Appreciates** the uses and impact of mirrors.

7. Application to daily life and concern to bio-diversity:

- **Applies the knowledge in daily life:** Use the spherical mirrors in day-to-day life.
- Uses the formula properly.

Period wise allotment:

Period	Content	Strategy	TLM/Resources	Evaluation
1	Reflection of light by spherical mirrors	Activity, group discussion.	Text book, chart, Spherical mirrors, IFP	1. How many types of spherical mirrors are there? Draw the figures of those mirrors. 2. Draw the diagram showing the different points to understand nature of reflected rays with spherical mirrors. 3. What do you understand by lateral inversion?
2	Observing the images formed when object is placed on the principal axis of the concave mirror at various places	Lab activity	Optical bench/table concave mirror, 'V' stand. Meter Scale, candle	4. How do you verify if the object is placed on 'C' image is formed at 'C'? 5. List out the material required to find the focal length if the concave mirror. Explain the experimental process. 6. Prepare a table to note down the observations if object is placed on the principal axis in front of the concave mirror for all possible positions?
3	Ray diagrams for concave mirror	activity	Optical bench/table concave mirror, 'V' stand. Meter Scale, candle, IFP	7. Draw the ray diagram if the object is placed on 'C' image is formed at 'C'for a concave mirror? Mention its properties. 8. Draw the ray diagram if the object is placed on 'f', for a concave mirror, find the object and mention its properties. 9. Draw the ray diagram if the object is placed on principal axis between 'C and f' image is formed at 'beyond C' for a concave mirror? Mention its properties. 10. If the magnification the image is -1, mention the characteristics of the image.
4	Ray diagrams for convex mirror Mirror formula, Sign convention, applications	activity	Optical bench/table concave mirror, 'V' stand. Meter Scale, candle	11.Draw the ray diagram of the image formed if an object is placed in front a convex mirror. Mention its properties. 12.If spherical mirrors are not there, write the consequences of human daily life.
5	Left over topics in the what you have learnt questions.(Note : all topics related what you have learnt has been discussed in the relevant topic day only)	Discussion Group activity,	Text Book, IFP, online resources	13.Write the uses of convex mirrors. 14.Write the uses of convex mirrors. 15.What would happen if spherical mirrors were not invented?
6	Mirror formula-based questions & solutions.	Discussion Individual/group		16.The radius of curvature of the concave mirror is 30 cm. Then find the focal length of the mirror. 17.An object is placed at 12 cm distance from the pole of concave mirror and the image formed at 4 cm from the pole. Find the focal length of the mirror.

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the lesson:2. Chemical Reactions

Class :**10**

No. of periods required : 5

Academic standards:

1. Conceptual Understanding:

- **Explains** the methods to be followed in writing and balancing the chemical equations.
- **Identifies** the reactants and products.
- **Gives examples** for different chemical reactions.
- **Gives reasons** for chemical reactions taking place between definite materials.
- **Compares** and contracts between Chemical combination, chemical decomposition; Chemical oxidations and reduction.
- **Solves problems** based on chemical reactions like mass and mass relation, mass and volume relation etc.

2. Asking questions and making Hypothesis:

- **Predict**: the products in a chemical reaction; activity series of the metals; Gasses evolved.

3. Experimentation- Field Investigation:

- **Activity/Exp:** Reaction between slaked lime and water; Reaction between HCl and Metal; reaction between $BaCl_2$ and $NaSO_4$; Electrolysis of water, formation of lead iodide, reduction reaction on copper oxide.
- Develops the **observation** skills, documentation skills, **experimental skills.**
- **Conduct experiments** to observe changes in color, temperature or gas formation during chemical reactions;

4. Information skills and Project:

- **Collects** information related to prepare various substances using different types of chemical reactions.

- Collects information and prepares reports about the methods followed to prevent corrosion of iron.

5. Communication through drawing Pictures:

- Makes models and prepares flow charts to explain the rules followed while balancing chemical equations.

6. Appreciation and aesthetic sense - values:

- **Appreciates** the chemical nature exhibited by different substances and the products formed by chemical reactions.
- Admire the wonders in chemical reactions that occur as and in oxidation,reduction, Exothermic and endothermic and appreciate the role of chemical reactions in day to day life.

7. Application to daily life and concern to bio-diversity:

- **Identifies** the diverse chemical reaction of substances.
- **Applies** the results of different chemical reactions in daily life.

Period wise allotment

Period	Content	Strategy	TLM/Resources	Evaluation
1	Prerequisites/Types of chemical reactions Valences, Formulas of compounds,	Activities	Text Book	1. Name mono valency elements. 2. Mention the valency of N, O, Ca and Al. 3. Write the formula of water/carbon di oxide/sodium chloride.
2	Chemical reactions writing word equations and formula/symbol representation.	Activities, Discussions, Group wise discussions	Text book, balanced equations chart etc.	4. Magnesium ribbon is burnt in the air and formed the magnesium oxide. Write the balanced equation for the above reaction? 5. $Zn + HCl \rightarrow ZnCl_2 + H_2$ Write the reactants and products in the given equation. Balance the above equations. What information does it give us?
3	Balancing the chemical equations	Activities-Group Activities	Zn, HCl, Beaker, water, $CaCO_3$, Test tube, spirit lamp. etc.	6. $Fe_2O_3 + Al \rightarrow Al_2O_3 + Fe$ $Zn + HCl \rightarrow ZnCl_2 + H_2$ $NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$ 7. $Pb(NO_3)_2 + KI \rightarrow PbI_2 + KNO_3$ Balance the above equations? 8. $Fe_2O_3 + Al \rightarrow Al_2O_3 + Fe$ What information does the above?

4	Mass & Mass relation – problem solving - Mass & volume, Volume – Avogadro number relation – problem solving	Discussion, Observation, Field Visit	Copper turnings, Watch glass, Spirit Lamp, Apple Fruit, Iron Pieces , Brass.	9. Calculate how much volume of 8g. Hydrogen gas occupies at STP. 10. Calculate how much oxygen is required to combust the 2 moles of magnesium. 11. Find the volume of the evolved hydrogen gas when 460 grams of sodium reacts with water at STP.[Na(A=23U,H=1U,O (A=16U)] 12. Write the reactants and products when 232 grams of butane is combusted with oxygen and write the balanced chemical equation. Calculate how many carbon-di-oxide molecules are there in the evolved gas in this reaction.
5	Left over topics from what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	Discussion Group activity,	Text Book	13. The amount of oxygen is required to combust the 240g.of carbo () A)320 B) 64 C) 120 D) 240 14. Which of the following one is a balanced equation ( ) A)C + O_2 → COB) Mg + O_2 → MgO C) Fe_2O_3 + Al→Fe + Al_2O_3 D) $CaCO_3$ → CaO+CO_2 15. Na_2SO_4 + $BaCl_2$ → A +B products A and B in the given reaction are () A) Na_2SO_4, $BaSO_4$ B) $BaSO_4$, NaCl C) NaCl, $BaCl_2$ D) Na_2SO_4, $BaCl_2$

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the lesson :3. Acids, Bases and Salts

Class :**10**

No. of periods required :9

Academic standards

1. Conceptual Understanding:

- **Explains**: different properties of acids and bases, their reactions with metals and non metals; neutralization reaction; types of indicators to identify the nature of the substances; olfactory indicators; pH scale;
- **Differentiates** between acids and bases.
- **Classifies** the material into acidic nature and base nature.
- **Gives the reason** why dry HCl does not turn blue litmus paper red; for the strength of different acids and bases; for the formation of salts and its nature;
- **Gives examples** to acids bases salts and their products.
- **Compares** the reactions of acids and bases with metals and non metals.
- **Analyses** the reactivity of acids and bases with metals and non metals.

2. Asking questions and making Hypothesis:

- **Predict** the pH scale value of acids and bases, salt formed in the chemical reaction of acid and base, strength of acids and bases;
- **Makes hypothesis** regarding the reactivity of acids and bases with metallic and non-metallic oxides.
- **Makes hypothesis** on the effect of decreasing and increasing of p^H value on different substances.

3. Experimentation- Field Investigation:

- **Tests the nature** of given substances using various indicators (such as litmus paper, phenolphthalein, methyl orange, and universal indicator).
- **Conducts experiments to observe** the reactions of acids and bases; Reaction of acids and bases with metals; Reaction with non-metals; Reaction with carbonates and hydrogen carbonates; Neutralization reactions between acids and bases;

Electrical conductivity tests of acidic and basic solutions; Preparation of dilute. hydrochloric acid (HCl) in the lab; Identification of pH values using pH paper or a pH meter; etc.

- **Suggests alternative apparatus or instruments** and setups to carry out the above experiments, prepare a report based on the observations and results, and display findings effectively.
- **Conducts a field investigation** by: Collecting soil samples from different locations (e.g., school ground, home garden, agricultural land); Testing the pH of soil to determine whether it is acidic, basic, or neutral in nature.

4. Information skills and Project:

- Collects information about the pH scale, uses of various salts, effect of acids and bases and analyze them.
- Analyses the tables containing results of reactions of different acids and bases with indicators.
- **Collect information** from textbooks, reference books, and digital resources about acids, bases, and salts, including their uses in daily life and industries; on the pH of common household substances (like lemon juice, baking soda, soap solution, etc.) using pH paper or universal indicator.
- **Gather information on natural indicators** (e.g., turmeric, China rose, litmus, red cabbage) and their color changes in acidic and basic media.
- **Conduct a survey or interview** to find out the usage of acids, bases, or salts in agriculture.
- **Prepare a project report** on the harmful effects of acid rain or the role of pH in agriculture and healthcare.

5. Communication through drawing Pictures and model making:

- **Draws diagrams/experimental setups** of reactions of Zn pieces with aqueous HCl, chemical reactions of metal carbonates and metal hydrogen carbonates, electrical conductivity in salts, all compounds contain hydrogen are not acids; testing the nature of the hydrogen chloride gas; removing water of crystallization.etc.
- Makes or prepares the natural indicators.

6. Appreciation and aesthetic sense - values:

- Appreciates the importance of acids, bases, and salts in daily life, such as in food, medicine, cleaning agents, and agriculture.
- Shows awareness of the safe and responsible handling of acids and bases in laboratory and household settings.
- Develops a sense of environmental responsibility by understanding the harmful effects of acid rain on monuments, vegetation, and aquatic life.
- Recognizes the value of natural indicators (like turmeric, beetroot, and red cabbage) and appreciate traditional knowledge in science.
- Respects laboratory resources and maintain cleanliness and discipline during experiments involving chemicals.
- Appreciates the role of science in addressing **real-life problems**, such as soil pH management in agriculture or neutralization in treating acidic waste.

7. Application to daily life and concern to bio-diversity:

- Applies the concept of neutralization in real-life situations, such as treating insect bites, soil treatment in agriculture, and industrial waste management.
- Recognizes the importance of pH in agriculture, such as determining soil acidity or alkalinity to improve crop growth and yield.
- Identifies the diversity in the behavior of different substances as acids bases and neutral substances.
- Uses the reactions of various acids bases, salts and neutralization in daily life, suggests solution to the problems faced.
- Uses knowledge of acids and bases in choosing household products (e.g.: cleaning agents, soaps, shampoos) based on their pH and safety.
- Understands the environmental impact of acid rain on biodiversity, including damage to forests, aquatic life, and soil health.

Period wise allotment:

Period	Content	Strategy	TLM/Resources	Evaluation
1	Introduction- Chemical properties of Acids and Bases	Activity-group discussion	Diff. Acids & Bases, litmus papers R&B Indicators Phenolphthalein, Methyl Orange	1. Prepare a table to note the observations if tested with the B&R litmus paper and Phenolphthalein, Methyl Orange indicators with diff. acids and bases.
2	Reaction of Acids and Bases with metals	Activity-group discussion	HCl, Zn, Test tube, L-shaped straw, beaker, splinter, water, soap,NaOH	2. List out material required to prove if Acids reacts with some metals evolves H_2 gas, and also explain the experimental process. 3. List out material required to prove if NaOH reacts with Zn, evolves H_2 gas, and also explain the experimental process.
3	Reaction of carbonates and metal hydrogen carbonates with acids	Activity-group discussion	Na_2CO_3, HCl, Ca $(OH)_2$, water, soap,NaOH, Test tubes, L-shapedstraw, Stand.	4. List out material required to prove if Acids reacts with carbonates/bi-carbonates evolves CO_2 gas, and also explain the experimental process. 5. In an experiment an Acid reacts with carbonate and evolved a gas. How do you conform the evolved gas is CO_2?
4	Neutralization reactions- acids-bases, Acids bases combined reactions with water	Activity-group discussion	NaCl, HCl, water, wires, bulb, dry sticks (10 cm.), sugar/glucose, Acid, dropper	6. Give examples for Neutralization reactions 7. A person is suffering from acidity. What will you suggest him to get relief from it? 8. A field is acidic in nature. To get good yielding of crop, what will you do? 9. List out the material required to prove, every compound which have hydrogen is not an acid. Explain the experimental process.
5	Do ions are produced only in aqueous solutions? Activity	Activity-group discussion	NaCl, H_2SO_4, dry and wet litmus paper, test tubes, straw, one holed cork.	10. In an experiment HCl gas is evolved. A student is testing the evolved gas with wet and dry blue litmus paper. Which of them turns red? Why ? 11. If NaCl, H_2SO_4aqueous solutions are mixed. What happens? What are products? Write the chemical equation and balance it.
6	pH Scale; Strong and weak Acids/Bases	Activity-group discussion	pH Papers, Diff. Acids & Bases, Diff. fruit juices and Vegetables	12. Write a note about pH scale. 13. The pH values of a, b and c is 0,7and 13.5respectively. Classify them into a table in which is strong acid, strong base and neutral.
7	Importance of pH value in daily life	group discussion, Charts	Text Book, Chart.	14. If pH value of saliva juice is less than 5.5, What happens? Suggest a remedy. 15. Do all plants are animals are pH sensitive? 16. Self defense by animals and plants through chemical war fare. Explain.
8	NaCl- its salts-products- plaster of Paris	group discussion, Charts	Text Book, Chart, baking soda, washing soda, bleaching powder, plaster of Paris.	17. List out the compounds which are produced by common salt, and also write their formulas. 18. Why do we use plaster of Paris to make idols? Explain. 19. If we heated the copper sulphate crystals in a test tube. Whathappens? Why?

9	Left over topics from what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	Discussion Group activity	Text Book	MCQ

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's Reflections

Period number	Teachers reflections	Teacher signature with date

Name of the lesson: 4. Refraction of light through curved surface

Class :**10**

No. of periods required : 9

Academic standards:

1. Conceptual Understanding:

- Explains refraction of light through curved Surfaces based on the knowledge of refraction of light through plane surfaces; Explains the terms to be used for refraction through curved surfaces; Explains lens and its types; Explains the principles involved in drawing ray diagrams for lens; Explains in his own words how to draw a ray diagrams; Explains the need of paraxial approximation and gives reasons.
- Gives reasons for the characteristics of images in ray diagram; elaborates the reasons behind principles of drawing ray diagrams.
- Derives lens formula; Derives Lens maker's formula and apply to solve the problems.
- Differentiates between: real image and virtual image; concave mirror and convex mirror;

2. Asking questions and making Hypothesis:

- Imagines the approximation while deriving
- Predicts the results of experiments with lens; predict the influencing factor of the lens focal length; Predict the medium effect on the focal length of a lens.
- Questions on the drawing of ray diagrams.
- Questions to clear the doubt that the focal length of an object immersed in water depends on its surroundings.

3. Experimentation- Field Investigation:

- Experiments: To find out focal length of lenses; Observe the images if the object is placed at distinct positions on the principal axis of a convex lenses;
- Follows the precautions during the experiment.

- Tabulates the information-Prepares reports.
- Concludes the result of the experiment; To find out focal length of Lenses; Observe the images if the object is at placed distinct positions on the principal axis of a convex lenses; Finds out the focal length of lens through an experiment.
- Follows the precautions while experimenting with lens.

4. Information skills and Project:

- Collects the information regarding lens
- Analyses the information of magnification of images formed by the lenses; information of object distance and image distances and focal length; Analyze information of the ray diagrams formed by lenses.
- Prepares new projects like usage of lenses in different fields;
- Prepares /makes lenses with different material.

5. Communication through drawing Pictures:

- Draws ray diagram showing the images formed by convex and concave lenses.
- Identify the focal plane and draw the diagrams related to focal plane;
- Draws the diagram showing the arrangement showing the experimental set to observe the nature of the images formed by convex and concave lenses.
- Makes a model lens.

6. Appreciation and aesthetic sense - values:

- Appreciates the lens maker formula
- Conserves values

7. Application to daily life and concern to bio-diversity:

- Applies the knowledge of lens to overcome daily life problems.

Period wise allotment

Period	Content	Strategy	TLM/ Resources	Evaluation
1	Refraction of light at curved surface -Activity-1,	Activity-group discussion	Coin, beaker, water	1. Draw a ray diagram for a light ray when it is passing from air into water when incidents on curved surface 2. Draw the ray diagram passing from water into air. 3. Are both the rays passing from water into air and air into water has the same path? Why? Explain.
2	Image formation by curved surface	Activity-group discussion	Text Book, Chart, IFP	4. Explain how the image forms when a light ray passing from air to water?
3	Types of lenses-Focal length of the lens-behavior of certain light rays when they are incident on a lens.	Activity-group discussion	Different types of lenses, V-Stand-Screen, candle, white paper	5. Draw the shape of different types of lenses? 6. Point sources is given how do you trace the image of the point source? Explain with the ray diagram. 7. A light ray is passing into a lens from air. Mention the situations where does that ray not refract?
4	Rules to draw the diagrams for image formation by lens.	Activity-group discussion	Different types of lenses, V-Stand-Screen, candle, white paper	8. An object is placed 25 cm distance from the focal point of the convex lens; its focal length is 15 cm. Find the distance of the image formed and draw the ray diagram. 9. An object is placed 15 cm distance from the pole of a convex lens; its focal length is 15 cm. Find the distance of the image formed and draw the ray diagram. 10. An object is placed 25 cm distance from the focal point of the concave lens; its focal length is 15 cm. Find the distance of the image formed and draw the ray diagram.
5	Rules to draw the diagrams for image formation by lens.	Activity-group discussion	Different types of lenses, V-Stand-Screen, candle, white paper	11. Draw the shape of different types of lenses? 12. Point sources is given how do you trace the image of the point source? Explain with the ray diagram. 13. A light ray is passing through the lens from air. Mention the situations where that ray does not refract.
6	Some problems - examples to solve-Activity -2	Activity-group discussion	Chart, Text Book	14. Magnification of the is 1.5 and object height is 3cm then find the height of the image formed when a convex lens is used? 15. An object is placed 20cm distance from the pole of a convex lens, the focal length of the lens is 30cm.Then find the where the image is formed? Mention the characteristics of the image.
7	Lens formula – solving problems	group discussion, Charts	Text Book, chart	16. If you want to make a lens, how do you fix the focal length of that lens. (Mention the lens maker's formula and mention each letter in the formula?
8	Activity-3- Lens maker's formula	group discussion,	Text Book, Chart	17. The curvature radii of a lens are 35 cm and 30cm respectively. The refractive index of is 1.Find the focal length of the lens.

9	Left over topics from what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	group discussion,	Text Book	18. MCQ

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the lesson: Chapter - 5: Human eye and colourful world

Class : **10**

No. of periods required :10

Academic Standards:

1. Conceptual Understanding:

- **Explains** angle of vision, accommodation and structure of an eye; Explains least distance of distinct vision; Explains the method of formation of RAINBOW; Explains scattering; Explains the structure and working of the human eye; Explains the functions of different parts of the eye: cornea, lens, iris, retina, aqueous humor, vitreous humor, and optic nerve; Explains the process of image formation in the eye and the role of the ciliary muscles in accommodation; Explains the near point, far point, and the range of vision of the human eye; Explains vision defects: myopia, hypermetropia, and Presbyopia; and their correction using lenses; Explains the phenomenon of refraction through the atmosphere; Explains the concepts of dispersion, scattering of light. Explains natural phenomena like the blue colour of the sky, reddish appearance of the sun at sunrise and sunset, formation of a rainbow and twinkling of stars.
- **Differentiates** dispersion of light and scattering of light. Differentiates myopia and hypermetropia.
- **Gives reasons** why the Sun appears red during sunrise and sunset**;** Gives reasons why the sky does appear blue**;** Gives reasons for the vision defects of the human eye.
- **Explains the phenomenon** of dispersion of light with reasons**;** Explains with reasons how to avoid vision defects.

2. Asking questions and making Hypothesis:

- **Questions** how the eye works.
- Questions to know the reasons for colour in RAINBOW
- .
- Questions to get a clear idea of scattering.

3. Experimentation- Field Investigation:

- **Experiments:** To determine the **least distance of distinct vision** of the human eye (usually around 25 cm for a normal eye); To find the **visual angle** or **field of view** of the human eye; To observe the phenomenon of dispersion of light; To observe the rain bow in the class room; To find the refractive index of prism material.
- **Precautions:**will take necessary precautions.
- **Observation:** observations are noted and tabulates them.
- **Visit to** a nearby ophthalmologist to know about vision defects of human eye.

4. Information skills and Project:

- **Collects i**nformation regarding scattering dispersing and other reflections.
- Collects the information on uses of prism.
- Collects information about C.V. Raman's research.
- **Interview:** Visit toa nearby ophthalmologist to know about vision defects of human eye and collect the information and analyze it.
- **Project:** Investigates how **vision care** and **eye health awareness** can prevent common eye defects among students and elders.

5. Communication through drawing Pictures:

- Draws diagram showing structure of eye; Draws a labeled diagram showing the structure of the human eye; Draws ray diagrams showing vision defects such as myopia, hypermetropia, and Presbyopia, along with their corrections using lenses; Draws a ray diagram showing the dispersion of white light through a prism (prism experiment); Draws the experimental setup for finding the angle of deviation and refractive index using a glass prism; Draws a graph between angle of incidence and angle of deviation based on the data collected in the prism experiment. ; Analyses the graph to determine the angle of minimum deviation and uses it to calculate the refractive index of the prism. ; Draws diagrams showing atmospheric phenomena such as formation of a rainbow, scattering of light.
-

6. Appreciation and aesthetic sense - values:

- **Appreciates** the working of an eye.
- Avoids the behavior that affects other eyes.
- **Sympathizes** people with vision defects
- Appreciates the formation of RAINBOW and its explanation with concept of waves.
- Shows **interests** in aspects related to light.

7. Application to daily life and concern to bio-diversity:

- Explores **applications** of scattering and dispersion in real life — such as optical instruments, photography, astronomy, and atmospheric studies**.**
- **Solves daily life problems** with efficiency.
- Realizes the responsibility of **donating** eyes.

Period wise allotment:

Period	Content	Strategy	TLM/ Resources	Evaluation
1	Least distance of distinct vision – Activity-1 &2	Activity-group discussion	Stand,sticks, scale, protractor.	1.Explain the process to find the least distance of distinct vision of a healthy person. What material do you need to prove it? 2.Explain the process of finding the angle of distinct vision.
2	Structure of human eye, Accommodation of eye-Focal length of eye (Min., Max.)	Activity-group discussion	Chart, 3D-video lesson, book	3.Explain the accommodation property of human eye. 4.What happens if ciliary muscles were not function properly?
3	Focal length of eye (Min., Max.)	Activity-group discussion	Chart, 3D-video lesson, book	5.Mention the least distance of distinct vision of a human. 6.Find the max and min. focal length of human eye. 7.Explain how human eye can see the near as well as so far objects.
4	Eye defects-myopia-	Activity-group discussion	Chart, 3D-video lesson, book	8.Write about myopia. 9.A person cannot see nearby objects. So, mention which eye defect the person is suffering from? And also mention how can it be corrected?
5	Hypermetropia- -Presbyopia	Activity-group discussion	Chart, 3D-video lesson, text book	10. A person cannot see far objects. So, mention which eye defect the person is suffering from? And also mention how can it be corrected? 11. Draw a diagram showing the eye defects of myopia and hypermetropia and also draw the showing the

				corrections of the defect.
6	Dispersion of light-Prism-Lab activity	Activity-group discussion	Chart, 3D-video lesson, text book	12. Write in your own words about dispersion of light?
7	Finding the refractive index of the prism-Formula derivation	Activity-group discussion	Chart, 3D-video lesson, text book	13. Mention the material required to find the refractive index of a prism material, and mention an experimental procedureof finding the refractive index of the prism.
8	Activity -3 & 4-Dispertion of light-	Activity-group discussion	Chart, 3D-video lesson, text book	14. What is dispersion of light? 15. Have you observed the dispersion of light in the daily life situations?
9	Activity – 5-Formation of rainbow-Scattering of the light-Activity – 6	Activity-group discussion	Chart, 3D-video lesson, text book	16. Mention the arrangements of the apparatus to show the rainbow in the class room. 17. Suggest an experiment to show scattering of light.
10	Left over topics from what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	Activity-group discussion	Text book, IFP	MCQ

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections

Period number	Teachers reflections	Teacher signature with date

Name of the lesson: 6. Structure of Atom

Class :**10**

No. of periods required : 7

Academic standards

1. Conceptual Understanding:

- **Explains** wave nature of light, electromagnetic spectrum, atomic models of Bohr. Somerfield, Quantum theory, structure of electron Principles will explain ; Explains the equations of electronic spectrum ; explains Paul's Aufbau's and Hund's rules with examples.
- **Gives examples** of different quantum numbers.
- **Compares** the atomic models of Bohr and Somerfield.
- **Gives reasons** for light exhibiting wave nature; Give reason why Cu and Cr have different arrangement of electronic configurations.
- Writes electronic configuration based on Moeller's chart imagines ene
-
- rgy levels.
- **Describes** the concept of **valency** and how it is determined based on the outermost shell.
- **Relates** atomic structure to the **periodic classification of elements**.
- **Differentiates** various atomic models and justifies the acceptance of Bohr's model.

2. Asking questions and making Hypothesis:

- **Questions** to about electromagnetic spectrum, different atomic spectra and quantum numbers.
- **Imagines** the electronic configuration and energy levels based on the values of n, l, m. Imagines the next energy levels as per the rules of Aufbau, Pauli, Hund.
- **Asks meaningful questions** related to atomic models and their limitations; Asks questions about the differences in properties of isotopes and their real-world uses.
- **Questions** the stability of atoms and the arrangement of electrons in different shells.
- **Hypothesizes** what would happen if neutrons did not exist in the nucleus.
- **Predicts** chemical behavior of atoms based on electronic configuration; Predicts how atomic number affects the identity and nature of elements.

3. Experimentation- Field Investigation:

- Comments on structure of atom based on electro magnet and hydrogen spectrum.
- Discusses the highlights and results of experiments related to the atomic theories proposed by Bohr and Somerfield.
- Investigates how atomic theory applies in fields like medicine, archaeology (carbon dating), and nuclear energy

4. Information skills and Project:

- **Collects** and prepares a news report about the experiments of Bohr, Somerfield, Max Planck.
- **Fills the table of** electronic configuration of various elements and analyze it.
- **Prepares tables** of electronic configuration of various elements.
- **Researches historical development** of atomic theories and models and collect information.
- **Prepares projects on:** Models of the Atom through History"
- **Gathers data** on atomic numbers, mass numbers, and electron configurations of elements.

5. Communication through drawing Pictures:

- **Draws rough diagrams of** Bohr and Sommerfield models of atomic structure.Draws the shape of the orbitals.
- **Prepares flowcharts** to know the electronic configuration.
- Illustrates **electronic configurations** of atoms using shell diagrams.
- Uses tables to represent atomic number, mass number, number of electrons, protons, and neutrons.

6. Appreciation and aesthetic sense - values:

- **Appreciates** the wonders in electromagnetic spectrum.
- Appreciates the discoveries explaining the internal structure of the tinies atoms.
- Appreciates the aspects not proved by experiments are proved using mathematical principles.

- Appreciates the contributions of scientists like **Dalton**, **Thomson**, **Rutherford**, **Bohr**, and **Chadwick**.
- **Develops interest** in atomic science and its impact on technological development.
- **Recognizes** how deep inquiry and experimentation lead to scientific progress.
- Shows **respect** for scientific discoveries that help understand the unseen micro-world.

7. Application to daily life and concern to bio-diversity:

- Uses Moeller's diagram to write electronic configuration of other elements based on quantum number. Applies understanding of atomic structure to real-world applications: Medical uses of isotopes (e.g., in cancer treatment);Carbon dating in archaeology. ; Nuclear energy and its role in energy production.
- Understands the safe use and environmental impact of radioactive substances.
- Encourages awareness of radiation safety and nuclear waste disposal.
- Relates atomic theory to chemical reactions observed in everyday life.

Period wise allotment;

Period	Content	Strategy	TLM/ Resources	Evaluation
1	Activity-1- Wave nature of light- Electromagnetic spectrum	Activity-group discussion	Spirit lamp, Spatula, match box, diff. salts	1. What is the colour of the 'Na'/Ca/ Cu/Co salt if it will burn on the flame? 2. What you have observed and conclude from this experiment?
2	Activity-2Bohr's Model of hydrogen atom and its limitation-	Activity-group discussion	Chart, Video clipping, Text book	3. Mention the Bohr's postulates and also mention the limitations?
3	Bohr – Somerfield model of an atom	Activity-group discussion	Chart, Video clipping, Text book	4. What information thus the Bohr – Somerfield structure gives us? 5. Draw the diagrams showing the comparison of principle quantum number and azimuthally quantum number?
4	Quantum, mechanical model of an atom- Quantum Numbers	Activity-group discussion	Chart, Video clipping, Text book	6. What information does the principal quantum number give us? 7. Mention the main features of the quantum atomic theory. 8. From the table (text book) frame some questions to understand the quantum numbers.
5	Quantum, mechanical model of an atom- Quantum Numbers	Activity-group discussion	Chart, Video clipping, Text book	9. What information does the principal quantum number gives us? 10. Mention the main features of the quantum atomic theory. 11. From the table (text book) frame some questions to understand the quantum numbers.
	Electron configuration —The	Activity-group	Chart, Video	12. Explain Aufbau principle with one example.

6	Pauli exclusion principle- Aufbau principle- Hunds rule	discussio n	clipping, Text book	13. Explain Hund's rule with one example. 14. Explain Pauli rule with one example.
7	Left over topics from what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	group discussio n	All the question left over in the lesson	Discuss all the questions which are not discussed during the last periods.

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the lesson:7 . Classification of Elements and Periodic Table

Class :**10**

No. of periods required : 10

Academic standards

Academic Standards:

1. Conceptual Understanding:

- **Explains** Dobereiner law of Triads, Newland's law of Octaves, characteristics of Modern periodic table.
- **Classifies** elements on the basis of atomic number and electronic configuration.
- Explains the **difference between** Mendaleeff's periodic table and the modern periodic table.
- Gives **reasons** why different exhibit same characteristics as per Dobereiner's and Newland's theories.
- **Describes** the layout of the Modern Periodic Table—groups, periods, blocks.
- **Explains** trends in the periodic table: atomic size/radius, Metallic and non-metallic character, Valency, Ionization energy, Electronegativity
- **Relates** the position of an element in the periodic table to its properties.

2. Asking questions and making Hypothesis:

- **Questions** why elements exhibit common characteristics though they are special when compared to other elements.
- **Discusses** Mendaleeff's hypothesis and proofs in a later period.
- **Makes hypothesis** on the properties of elements based on periodicity.
- **Asks questions about** why early classification methods failed.
- **Questions** how Mendeleeff could predict the properties of unknown elements.
- **Predicts** how element properties change across a period or down a group.
- **Forms hypotheses** such as: "If the atomic number increases, the valency may change."
- **Questions** the positioning of hydrogen and lanthanides/actinides in the periodic table.

3. Experimentation- Field Investigation:

- Discusses Dobereiner's triads Newlands Octaves, Mendeleeff's Periodic law.

4. Information skills and Project:

- **Collects** and **analyses** the information on elements hypothesized by Mendeleeff.
- **Tabulates** and displays the information related to the characteristics exhibited by different elements to periods and groups based on periodic table.
- **Collects** and displays the additional information needed to explain ionization energy andelectron affinity.
- Collects information about the **history of periodic table development** and key scientists (Dobereiner, Newlands, Mendeleeff, Moseley)
- Compiles data on **periodic properties** and element classification.
- Prepares a **timeline or flowchart** showing the evolution of the periodic table.
- Creates a **project on the importance of the periodic table** in chemistry and industries.
- Gathers information about **uses of elements** based on their group or period.

5. Communication through drawing Pictures:

- **Prepares flow charts** to explain periodic rules of Dobereiner, Newlands and Mendeleeff
- **Prepares block diagram**, flow charts to show the characteristic of modern periodic table.

6. Appreciation and aesthetic sense - values:

- **Appreciates** that different elements in nature exhibit diversified characteristics.
- Appreciates that Mendeleeff's hypothesis became true that elements are arranged in an order.
- Appreciates the systematic classification of elements and how it simplified the study of chemistry.
- **Acknowledges** the contributions of early scientists who worked on classification.
- **Respects** the process of scientific refinement and correction (e.g., shift from atomic mass to atomic number).
- **Develops curiosity** to explore how properties of elements relate to their structure.

7. Application to daily life and concern to bio-diversity:

- Identifies the **diversity** displayed in the arrangement of elements having different characteristics.
- Identifies the **relation between groups** and periods in periodic table and also the properties of elements.
- **Uses rules of periodic** table in solving chemistry problems.
- **Applies knowledge** of periodic table to identify **useful elements in daily life** (e.g., Fe, Cu, Na, Cl, O_2).
- Encourages the **safe and responsible use** of chemical elements and awareness about heavy metal pollution (like lead, mercury).

Period wise allotment

Period	Content	Strategy	TLM/Resources	Evaluation
1	Need for the arrangements of elements in an organized manner-Dobereiner's triads-Its limitations	Brainstorming, Group discussion/ Individual Discussion Activity Giving examples	Text book Dobereiner triads chart	1. What is the necessity of the classification of elements? 2. Explain Dobereiner triads. 3. Write the limitations of Dobereiner triads?
2	Newlands law of Octaves-Limitations	Group discussion/ Individual Discussion Activity Giving examples	Text book Flash cards, Octaves Charts,	4. Explain law of octaves in your own words. 5. Mention the limitations of law of octaves.
3	Mendaleeff's Periodic table-The periodic law- Silent features of the Mendaleeff's periodic table-	Group discussion/ Individual Discussion Activity Giving examples	Text book Mendaleeff's periodic table	6. Mention the Mendaleeff's periodic law? 7. Explain the Mendaleeff's classification.
4	Mendaleeff's Periodic Table-Limitations	Group discussion/ Individual Discussion Activity Giving examples	Text book Mendaleeff's periodic table	8. Explain the limitations of the Mendaleeff's classification.
5	Mosley periodic law Modern periodic law Periods and Groups - Modern periodic table- Positions of elements in the modern periodic table	Group discussion/ Individual Discussion Activity Giving examples	Text book Modern periodic table, Phet simulations ICT	9. Explain the Mosley periodic law in your own words. 10. Explain the Modern periodic law in your own words. 11.Write differences between Mendaleeff's and modern periodic law. 12. How do you identify the position of an element in periodic table? 13. How do quantum numbers help to identify the position of the element in the periodic table?
	Activity-2-Metals andnon-	Group discussion/ Individual	Text book Modern	14. Explain the metallic and non-metallic properties in

6	Metals	Discussion Activity Giving examples	periodic table, Phet simulations ICT	periodic table.
7	Properties of elements their trends in groups and in periods-	Group discussion/ Individual Discussion Activity Giving examples	Text book Modern periodic table, Phet simulations ICT	15. Mention the trends in the properties of elements across a period and down a group in the periodic table. 16. Explain the atomic radius/ ionization energy of elements across a period and down a group in the periodic table.
8	Properties of elements their trends in groups and in periods- Activity-3	Group discussion/ Individual Discussion Activity Giving examples	Text book Modern periodic table, Phet simulations ICT	17. Explain the Electron affinity/ oxidation and reduction properties of elements across a period and down a group in the periodic table.
9	Ionization energy- Influencing factors- Metallic and non-metallic properties	Group discussion/ Individual Discussion Activity Giving examples	Text book Modern periodic table, Phet simulations ICT	18. Mention and explain the influencing factor of ionization energy.
10	Left over topics from what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	Group discussion/ Individual Discussion Activity Giving examples	Flash cards, Summary Notes	19.MCQ

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the Lesson -8 : Chemical Bonding

Class :**10**

No. of periods required : 10

Academic standards:

1. Conceptual Understanding:

- Explains the need for chemical bonding based on the stability of atoms; Describes the concept of valence electrons and how atoms achieve stable electronic configuration; Explains ionic bonding**:** Formation of ions (cations and anions); Transfer of electrons from metal to non-metal.; Properties of ionic compounds (high melting and boiling points, conductivity in molten/aqueous state) ; Explains Lewis dot structure, rules of ionic and covalent bond, properties of matter, octetrule, molecular structure of water, oxygen; valence bond theory, hybridization; Explains covalent bonding**;** Sharing of electrons between non-metal atoms; Formation of molecules.; Properties of covalent compounds (low melting and boiling points, poor conductivity).; Explains polar and non-polar covalent bonds.;
- Differentiates between molecules of water and ammonia, ionic bond and covalent bond,sp, sp^2, sp^3hybridization; Differentiates between ionic and covalent bonds.
- Explains the reasons for bond angle of molecules and their properties.
- Explains giving reasons for the stability of molecules, following the Octet rule and to Participate in chemical bond; Explains bond formation with examples such as NaCl, H_2O, CO_2, $Cl_2$and CH_4

2. Asking questions and making Hypothesis:

- Questions to understand Lewis dot structure, properties of ionic and covalent substances and molecular structure.
- Makes hypothesis on the shapes of orbitals and the resultant molecular structure when participated in chemical bond.
- Imagines the shape of hybridized orbital's formed through hybridization.
- Makes hypothesis on the consequences if bond angle of water is 108^o
- Questions why atoms form bonds; Asks questions about properties resulting from different types of bonds.

- Hypothesizes what happens if atoms do not bond; Hypothesizes how bond type affects physical and chemical properties; Predicts the type of bonding based on the position of elements in the periodic table.

3. Experimentation- Field Investigation:

- Uses rules of chemical bonding to explain molecular structure through hybridized orbitals.
- Discusses the fundamental aspects of Lewis dot structure.
- Discusses Chemical bond and the resultant shape molecules and bond angle.

4. Information skills and Project:

- Collects the information about nature of substances, arrangement of molecules, bond angles and reasons for the bonds formed by bond angle.
- Collects the necessary information on relation between hybridization and the shape of orbitals, prepares reports on it.
- Collects information about various types of chemical bonds and real-life applications.
- Researches industrial applications of ionic and covalent compounds.
- Prepares projects on: Common ionic and covalent compounds in daily life. Importance of chemical bonding in biological molecules.
- Analyzes data on bond strength, bond length, and molecular geometry.

5. Communication through drawing Pictures:

- Draws pictures of molecular structures, method of formation of ionic and covalent bond through Lewis's dot structure; Draws covalent bond formation by electron sharing; Draws Lewis structures of simple molecules and ions. Uses diagrams to show the difference between ionic and covalent bonding.
- Analyses the molecular structures based on hybridization.
- Makes models of shapes of molecules using sticks and beads.
- Illustrates ionic bond formation by electron transfer diagrams.
- Represents molecular shapes using simple models or sketches.

6. Appreciation and aesthetic sense - values:

- Appreciates the formation of molecules through ionic and covalent bond; Appreciates that fact that some basic atoms in nature combine; Appreciates the role of chemical bonding in forming diverse substances.
- Observes the special properties and nature like salt dissolves in water and not in kerosene, visualizing the rules of chemical bonding.
- Recognizes the importance of bonds in life processes (proteins, DNA).
- Values the systematic study of bonding for scientific progress.

7. Application to daily life and concern to bio-diversity:

- Identifies the diversity in substances being ionic or covalent.
- Uses the rules of chemical bonding in writing, balancing the chemical equation - solves the problems.
- Applies knowledge of bonding to explain properties of household substances (salt, sugar, water).
- Understands the role of chemical bonds in medicine, agriculture, and industry.
- Appreciates how bonding affects the environment and materials used sustainably.
- Encourages responsible use and disposal of chemical substances based on bonding properties.

Period wise allotment

Period	Content	Strategy	TLM/Resources	Evaluation
1	Chemical bonding – its necessity- Lew's symbols- dot structure	Brainstorming, Group discussion/ Individual Discussion Activity Giving examples	Text book Lewis symbols- dot structure chart	1. Mention the valance of the elements Cl/Na/Mg/and inert gases

2	Chemical bonding – its necessity- Lewis symbols- dot structure	Group discussion/ Individual Discussion Activity Giving examples	Textbook, Lewis symbols- dot structure of Na and Cl; chart	2. Mention and draw the dot structure of Cl/Na/Mg elements
3	Electronic theory of valance by Lewis and Kossel	Group discussion/ Individual Discussion Activity Giving examples	Text book Flashcards,	3. Mention and draw the dot structure of the inert gas elements.
4	Ionic bonds with Lewis dot formulae	Group discussion/ Individual Discussion Activity Giving examples	Text book Ionic bond examples chart	4. Explain the formation of NaCl (ionic bond) using Lewis dot structure.
5	Ionic bond- factors affecting the formation of cations and anions	Group discussion/ Individual Discussion Activity Giving examples	Text book Ionic bond examples chart	5. Explain the formation of MgO (ionic bond) using Lewis dot structure.
6	Ionic bond - factors affecting the formation of cations and anions	Group discussion/ Individual Discussion Activity Giving examples	Text book Ionic bond examples chart	6. Explain the formation of $AlCl_3$ (ionic bond)using Lewis dot structure.
7	Lewis theory - Covalent bond- Formation of Oxygen, Nitrogen,	Group discussion/ Individual Discussion Activity Giving examples	Text book Lewis theory - Covalent bond- Formation of Oxygen, Nitrogen, Methane chart	7. Explain the formation of O_2(covalent bond)using Lewis dot structure. 8. Explain the formation of N_2 (covalent bond) using Lewis dot structure.
8	Lewis theory - Covalent bond- Formation of $BeCl_2$ and CH_4 molecules.	Group discussion/ Individual Discussion Activity Giving examples	Text book Lewis theory - Covalent bond- Formation of $BeCl_2$ and CH_4 molecules. Charts,	9. Explain the formation of $BeCl_2$ (covalent bond) using Lewis dot structure. 10. Explain the formation of CH_4 (covalent bond) using Lewis dot structure. 11. Explain the formation of BF_3 (covalent bond) using Lewis dot structure.
9	Draw backs of electronic theory of valance- VSEPRT- Limitations	Group discussion/ Individual Discussion Activity Giving examples	Text book Atomic structures of $BeCl_2$, BF_3	12. Explain the bond angle in $BeCl_2$, BF_3, H_2O and NH_3molecules. 13. Mention the limitations of VSEPRT.
10	Valance bond theory , Formation of beryllium chloride	Group discussion/ Individual Discussion Activity Giving examples	Text book Atomic structures of NH_3, CH_4	14. Explain the formation of $BeCl_2$ / Cl_2 etc. (Covalent bond)using valance bond theory.

11	Valance bond theory – Formation of Polar covalent bond	Group discussion/ Individual Discussion Activity Giving examples	Text book Valance bond theory – O_2, N_2 shape -chart	14. Explain the formation of / HCl/ H_2O (covalent bond) using valance bond theory.
12	Valance bond theory – Hybridization- Formation of Ammonia Water and HCl.	Group discussion/ Individual Discussion Activity Giving examples	Text book Valance bond theory – H_2O, NH_3 shape -chart	Explain the formation of H_2O/ N_2 (covalent bond) using valance bond theory hybridization.
13	Valance bond theory – Hybridization- Formation of Ammonia Water and HCl.	Group discussion/ Individual Discussion Activity Giving examples	Text book Valance bond theory – H_2O, NH_3 shape -chart	Explain the formation of BF_3 (covalent bond) using valance bond theory hybridization.
14	Left over topics in the what you have learnt questions.(Note : all topic related what you have learnt has been discussed in the relevant topic day only)	Group discussion/ Individual Discussion Activity Giving examples	Text book Valance bond theory –BF_3 shape -chart	MCQ

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the Lesson -9 : Electric Current

Class :**10**

No. of periods required : 9

Academic standards:

1. Conceptual Understanding:

- Explains electric current in his own words; Explains the difference between electric conductors and nonconductors. Explains Drude and Lorentz theory to explain electric current; Explains the difference between electric current and potential difference; Explains ohm's law; Explains on what values does the value of resistance depends; Explains series and parallel connections; Explains equivalent resistance; Explains electric shock, overloading, electric unit; Explains Ohm's Law**:** V=IR and applies it to solve numerical problems; Explains resistivity and how different materials respond to electric current; Explains electric power and electric energy, and uses formulas P=VI ; $P=I^2R$; , and $P=V^2R$; Explains units: ampere, volt, ohm, watt, kilo watt-hour**,** and their inter conversion**,** electric current**,** potential difference**,** resistance**,** and electric circuit**.**
- Elaborates the reasons for electric current.
- Describes factors affecting resistance: length**,** area (cross-section)**,** material**,** and temperature**;** Describes the combination of resistors in series and parallel circuits. Relates electrical concepts to daily life usage **(**e.g., electricity bills, household appliances).
- Compares the advantages and disadvantages of series and parallel connections.
- Differentiate between potential different and emf; differentiate between resistance and resistivity; Differentiate between conductivity and resistance.

2. Asking questions and making Hypothesis:

- Questions method of wiring a house.
- Questions on overload.
- Makes hypothesis on how to solve problems on Kirchhoff's rule.

- Questions how electricity flows in a conductor.
- Asks why certain materials allow current to pass through while others don't.
- Hypothesizes how changing the length or thickness of a wire affects resistance.
- Predicts outcomes when resistors are added in series vs parallel.
- Wonders about the safety and efficiency of electric power usage in homes.

3. Experimentation- Field Investigation:

- Experiments to prove that resistance depends on temperature, nature of substance, length of the conductor and cross section area.
- Follows the precautionary measures while conducting experiments.
- Verifies Ohm's Law through an experiment and draws the V-I graph**.**
- Measures current and voltage using ammeters and voltmeters.
- Sets up circuits to observe the effect of series and parallel combinations on resistance and current.
- Records and tabulates observations of voltage, current, and resistance.
- Uses appropriate symbols to draw electric circuit diagrams.
- Follows necessary safety precautions while handling electric components.

4. Information skills and Project:

- Analyze and classifies the material based the resistivity tables.
- Collects information related to the reasons for resistance.
- Collects additional information on electric shocks.
- Collects information on role and making of fuse.
- Collects information about applications of electric current in everyday life.
- Prepares projects on: Efficient use of electricity. Types of conductors and insulators; Domestic wiring systems.
- Analyzes how electric current is transmitted from power stations to homes**.**

5. Communication through drawing Pictures:

- Draws diagrams showing the method of working of a battery communication through them; Draws diagrams of series and parallel connections; Draws diagrams showing the movement of electrons in conductor; Draws circuit diagrams using proper symbols for battery, switch, resistor, etc.
- Plots V-I graphs to show the linear relationship as per Ohm's Law.
- Represents series and parallel resistor combinations pictorially.
- Creates tables to organize observations of current, voltage, and resistance.

6. Appreciation and aesthetic sense - values:

- Appreciates the behavior of electron which causes electric energy.
- Tries to prevent loss of electric energy.
- Implies aesthetic sense to the behavior of conductors.
- Appreciates the contribution of scientists like Georg Ohm**,** Volta**,** and others in electricity.
- Recognizes the importance of electricity in modern life and human development.
- Understands the value of saving electricity and using it efficiently.
- Encourages curiosity about electricity and respect for scientific reasoning.

7. Application to daily life and concern to bio-diversity:

- Uses the concepts of electricity in daily life.
- Selects the proper to be used for fuse.
- Search and follows the ways to use electricity properly as it is the backbone of nation's development.
- Applies knowledge of electric current to understand how devices like fans, lights, and heaters work.
- Calculates household electricity consumption and interprets electricity bills.
- Promotes energy conservation and use of renewable energy sources (solar, wind).
- Shows awareness about electrical safety**,** fuse usage, and avoiding energy wastage**.**
- Understands how electrical pollution (e.g., electromagnetic interference) may impact biodiversity.

Period wise allotment:				
Period	**Content**	**Strategy**	**TLM/Resources**	**Evaluation**
1	Activity-1- Electric current-	Brainstorming, Group discussion / Individual Discussion Activity Giving examples	Textbook Simple electric circuit chart, Connecting wires, bulb, switch, ammeter, battery	1. Draw a simple electric circuit.
2	Potential difference – Electromotive force	Group discussion/Individual Discussion Activity Giving examples	Text book, Simple electric circuit chart,	2. Differentiate potential difference and emf.
3	Ohm's law- Lab activity- Limitations of Ohm's Law	Group discussion /Individual Discussion Activity/ Experiment Giving examples	Text book, Simple electric circuit chart, Connecting wires, bulb, switch, ammeter, battery, iron nail, LED	3. List out the material required to verify the ohms law. 4. Mention the precautions to be taken in the Ohm's law verification. 5. Write the experimental procedure for verification of Ohm's law.
4	Electric shock- Effects- Factors of influencing the resistance of a material Activity-2,3	Group discussion/ Individual Discussion Activity/experiment Giving examples	Text book Simple electric circuit chart, Connecting wires, bulb, switch, ammeter, battery Different wires	6. Mention the factors that affect the resistance. 7. List out the material required to verify that the resistance depends on nature of the material and write the experimental procedure. 8.List out the material required to verify that the resistance depends on length of the material and write the experimental procedure.
5	Electric shock- Effects- Factors of influencing the resistance of a material Activity-4 &5	Group discussion/ Individual Discussion Activity/Experiment Giving examples	Text book Simple electric circuit chart, Connecting wires, bulb, switch, ammeter, battery Different wires	9. List out the material required to verify that the resistance depends on area of cross section of the material and write the experimental procedure. 10. List out the material required to verify that the resistance depends on temperature of the material and write the experimental procedure.

6	Resistivity	Group discussion/ Individual Discussion Activity Giving examples	Text book Resistivity chart	11. Mention the influencing factors of resistivity.
7	Electric circuits- series- parallel connections	Group discussion/ Individual Discussion Activity Giving examples	Text book Series / Parallel electric circuits charts Phet Simulations	12. Two resistors 100 ohms and 1 ohm are connected in series in one case, and parallel in another case. Find the resistant resistance in two cases. In which case the resistance is less?
8	Kirchoff's laws- Junction law- loop law- Applications	Group discussion/ Individual Discussion Activity Giving examples	Textbook, electric circuit with Junctions chart circuit with loops/Junctions chart	13. Different electric circuits problems – solutions.
9	Kirchhoff's laws-Junction law- loop law- Applications	Group discussion/ Individual Discussion Activity Giving examples	Textbook, electric circuit with Junctions chart circuit with loops/Junctions chart	14. Different electric circuits problems – solutions.
10	Electric power	Group discussion/ Individual Discussion Activity Giving examples	Text book Chart IFP	15.In an electric circuit 200V potential difference and 20A current is flowing. Find the Power in the circuit.
11	Electric power	Groupdiscussion / Individual Discussion Activity Giving examples	Text book ChartIFP	16. In an electric circuit 200V potential difference and 10 ohms resistor is connected in the circuit. Then find the Power in the circuit.
12	Left over topics in the what you have learnt questions.(Note : all topic related what you have learnt has been discussed in the relevant topic day only)	Group discussion/ Individual Discussion Activity Giving examples	Text book Chart IFP	MCQ

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the Lesson -10 : Electromagnetism

Class :**10**

No. of periods required : 14

Academic standards

1. Conceptual Understanding:

- Explains Oersted experiment; Explains electromagnetic field and the importance of its features; Explains magnetic flux density using the concept of magnetic lines of force; Elaborates that electric wires can induce magnetic field; Explains right hand rule; Explains that a charged, electrical wire moving in magnetic field and force; Explains through a situation relation between Faraday's principle and law of conservation of energy; Explains how to derive Faraday's principle from law of conservation; Explains the right-hand thumb rule to find the direction of magnetic field around a current-carrying conductor. ; Explains the working of an electric motor, including the role of magnetic field, armature, commutator, and brushes. ; Understands the principle and working of electric generator
- Derives F=BIL.
- Elaborates the working of electric motor and electric generator.
- Compares AC (Alternating Current) and DC (Direct Current)**.**

2. Asking questions and making Hypothesis:

- Makes hypothesis and questions to explain Oersted experiment.
- Makes hypothesis on how magnetic field induces force on moving charges.
- Questions on law of conservation of energy, Faraday's principle.
- Questions on what to do to make the electricity move round the wire in a motor.
- Questions about electric generator.
- Questions how electricity can produce magnetism and vice versa.
- Asks what happens when current flows through a conductor placed near a compass.
- Hypothesizes the factors affecting magnetic field strength in a solenoid.
- Predicts the direction of induced current based on motion and magnetic field.

3. Experimentation- Field Investigation:

- Experiments to explain Faraday's principle.
- Conducts experiments to show that magnetic field induces force on electrified wire.
- Performs or observes Oersted experiment using a compass and current-carrying wire.
- Constructs simple circuits to demonstrate magnetic field around a conductor, loop, and solenoid**.**
- Observes electromagnetic induction using a magnet and coil (Faraday's experiment).
- Verifies Right hand rule using practical demonstrations.
- Demonstrates the working model of an electric motor or an electric generator**.**
- Tabulates observations and draws conclusions.
- Takes necessary safety precautions while dealing with electric circuits.

4. Information skills and Project:

- Collects information about Faraday's experiment.
- Collects information about Oersted's experiments
- Collects additional information regarding electric motor and electric generator.
- Collects information about the **applications of electromagnetism** in real life (e.g., fans, speakers, electric bells, transformers).
- Prepares working models of: Electric motor; Generator; Electromagnet
- Studies the difference between AC and DC and their sources and prepare a report.
- Prepares projects on topics like: Use of magnetic field in transportation; Role of electromagnets in medicine and industry.

5. Communication through drawing Pictures:

- Draws picture on electric motor; Draws pictures of electric AC and DC; Draws necessary graphs to explain AC and DC generators; Draws magnetic field lines for: Straight conductor, Circular loop and Solenoid.
- Illustrates the right-hand thumb rule**,** right-hand rule with clear diagrams.
- Represents experimental data graphically where applicable.

- Uses tables and flowcharts to compare AC and DC, or to show differences between motor and generator.
- Makes a dc motor model.

6. Appreciation and aesthetic sense - values:

- Appreciates the experiments of Oersted and Faraday.
- Appreciates working of electric motor and generator.
- Appreciates usefulness of law of conservation of energy.
- Values the impact of electromagnetism on modern technology and life.
- Recognizes the elegance of magnetic field patterns and their role in understanding invisible forces.
- Shows curiosity about how electromagnetism is applied in daily devices.

7. Application to daily life and concern to bio-diversity:

- Uses generators and motors properly and also their theory.
- Solves the given problems.
- Puts efforts to save the labor of persons who invented electric motor and generator.
- Identifies the use of electromagnetism in electric fans, motors, generators, and household appliances**.**
- Understands the working of devices like induction stoves, doorbells, and electric cranes**.**
- Encourages safe use of electrical appliances based on electromagnetic principles.
- Understands the need to reduce electromagnetic pollution in sensitive areas like hospitals and forests.
- Promotes eco-friendly alternatives using efficient electrical systems to reduce energy waste.

Period wise allotment:

Period	Content	Strategy	TLM/Resources	Evaluation
1	Oersted experiment- Activity-1/Experiment	Brainstorming, Group discussion/ Individual Discussion Activity Giving examples	Textbook Connecting wires, switch, Magnetic compass, batteries	1. List out the material required to verify the oersted experiment. 2. Write the experimental procedure to verify the oersted experiment.
2	Magnetic field- Activity-2- Magnetic field lines –Magnetic flux-flux density/	Group discussion /Individual Discussion Activity Giving examples	Textbook Bar Magnet, iron dust, white paper	3. Draw the diagram showing the magnetic field lines around a bar magnet. 4. Explain the terms magnetic flux and flux density in your own words.
3	Activity-3 Magnetic field due to straight wire carrying current	Group discussion/ Individual Discussion Activity/Experiment Giving examples	Textbook, Copper wire , current source/Battery, switch, iron dust, wooden board, compass	5. Draw the shape of the magnetic field line due to current carrying straight wire and mention its direction and current direction. 6. List out and explain to observe magnetic field lines due to carrying straight wire.
4	Magnetic field due to straight wire - Activity-4&5	Group discussion/ Individual Discussion Activity/experiment Giving examples	Text book Copper wire, current source/Battery, switch, Iron dust, wooden board	7. Draw the shape of the magnetic field line due to current carrying coil wire and mention its direction and current direction.
5	Magnetic field due to solenoid- Activity- 6	Group discussion /Individual Discussion Activity Giving examples	Textbook,Copper wire (solenoid), current source/Battery, switch, iron dust, wooden board	8.List out and explain to observe magnetic field lines due to carrying solenoid
6	Magnetic Force on moving charge and current carrying wire- Activity – Examples	Group discussion/ Individual Discussion Activity/Experiment Giving examples	Text book, Copper wire, current source/Battery, switch, iron dust, wooden board, coil	9.How do you calculate the force experienced by a charge moving in a magnetic field?
7	Activity- 8 – Electric Motor	Group discussion/ Individual Discussion Activity/experiment Giving examples	Text book Copper wire, current source/Battery, switch, iron dust, wooden board, coil	10.Explain the principle of working motor 11. What is the role of slip rings in the electric motor? 12.What happens if slip rings were not there in the DC motor?

8	Electro Magnetic Induction – Faraday's Law-	Group discussion /Individual Discussion Activity Giving examples	Textbook Copper wire, current source/Battery, switch, bar magnet wooden board, coil, Galvanometer	13. Explain the faraday electromagnetic induction.
9	Electro Magnetic Induction – Applications of Faraday's Law	Group discussion/ Individual Discussion Activity/Experiment Giving examples	Textbook	14. Explain the applications of electromagnetic induction in day-to-day life.
10	Lenz's Law- Examples	Group discussion/ Individual Discussion Activity/experiment Giving examples	Text book	14. Explain Lenz's law.
11	AC Generator	Group discussion /Individual Discussion Activity Giving examples	Textbook	15. Explain the construction of AC generator.
12	AC Generator – Graphical representation	Group discussion/ Individual Discussion Activity/Experiment Giving examples	Textbook, ICT, graph	16. Mention the working principle of AC generator.
13	DC Generator	Group discussion/ Individual Discussion Activity/experiment Giving examples	Textbook, ICT, graph	17. Explain the construction of DC generator. 18. Mention the working principle of DC generator.
14	Left over topics in the what you have learnt questions.(Note : all topic related what you have learnt has been discussed in the relevant topic day only)	Group discussion/ Individual Discussion Activity/experiment Giving examples	Text book Simple electric circuit chart, Connecting wires, bulb, switch, ammeter, battery, Different wires	MCQ

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the lesson- 11. METALLURGY

Class : **10**

No. of periods required : 07.

Academic standards

1. Conceptual Understanding:

- Explains the basic forms(minerals) in which metals are available, methods of separating the metals, refining them and processes like smelting and roasting used in extraction of metals; Explains the reasons for non-availability of free metals in nature separating them using mechanical methods, conducting reduction reactions to get metals and for using furnace; Explain the terms: minerals, ores, gangue. Explain concentration, roasting, calcination, reduction, refining.
- Classifies minerals based on their reactivity, methods of separating and methods of refining
- Differentiates between metal and minerals, blast furnace and reverberatory furnace. Differentiate roasting and calcinations.

2. Asking questions and making Hypothesis:

- Questions the stages in separating and refining the metals; questions related to extraction methods.
- Makes hypothesis on the reasons for the appearance of mineral in many forms in nature; Makes hypotheses on the role of heat or chemicals in metal extraction.
- Predicts the results of oxidation and reduction reactions of metals.

3. Experimentation- Field Investigation:

- Experiments on rusting and using electrolysis in purification of copper.
- Discusses the separating the ore through mechanical methods stages and methods of using different types of furnaces.

4. Information skills and Project:

- Collects information about the areas in our state and India as where various ores are found prepares a report.
- Prepares reports analyzing the reasons for the occurrence of ores in different forms and their stability.
- Prepares a scrap with particulars of the minerals available in their surroundings like coal, limestone etc.

5. Communication through drawing Pictures:

- Draws the pictures of separating the minerals, electrolysis, furnaces etc. and comments on them.
- Draws pictures blowing the actions taking place in reverberating.

6. Appreciation and aesthetic sense - values:

- Appreciates that metals are present in the form of ores in nature.
- Shows interest in knowing the details of methods and equipments designed to extract different types of minerals
- Appreciates persons and systems who are involved in extracting and refining minerals, production of metals and making many instruments and objects from them.

7. Application to daily life and concern to bio-diversity:

- Discusses on the process of extracting and its impact on environment.
- Suggest the measures for conserving bio-diversity by analyzing mining and movements and struggles related to it.
- Co-ordinates the information from the lessons, chemical bonding and chemical equations to understand the chemical reactions taking place in a furnace, reactivity of metals and repeating the ores.

Period wise allotment:

Period	Content	Strategy	TLM/Resources	Evaluation
1	Occurrence of the metals in nature-Activity-1 Activity series of metals	Brainstorming, Group discussion/ Individual Discussion Activity Giving examples	Textbook Chart	1. Differentiate between ore and mineral. 2.Give examples for oxide/carbonate/sulphate ores/minerals

2	Extraction of the metals from the ores	Group discussion/ Individual Discussion Activity Giving examples	Textbook Chart- Concentration process	3.Mention and explain the concentration process of ore.
3	Reduction of purified ore to the metal	Group discussion /Individual Discussion Activity Giving examples	Textbook Chart	4. Explain the reduction of metal from ore of a high active metals.
4	Reduction of purified ore to the metal	Group discussion/ Individual Discussion Activity/Experiment Giving examples	Textbook, Chart	5. Explain reduction of purified ore to the metal.
5	corrosion - Activity-2	Group discussion/ Individual Discussion Activity/experiment Giving examples	Text book 3 Test tubes, iron nails, An hy. $CaCl_2$,oil, corks,water	6. List out the material required to verify that water and is essential for rusting of iron articles and explains the experimental procedure.
6	Few important processes used in metallurgy	Group discussion/ Individual Discussion Activity Giving examples	Textbook Connecting wires, switch, Magnetic compass, Magnet	7. Differentiate between roasting and calcinations.
7	Left over topics in the what you have learnt questions.(Note : all topic related what you have learnt has been discussed in the relevant topic day only)	Group discussion /Individual Discussion Activity Giving examples	Textbook Bar Magnet, iron dust, white paper	MCQ

Teacher's notes (additional resources)

Period number	Teachers notes	Teacher signature with date

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date

Name of the lesson: 12. Carbon and its Compounds

Class : **10**

No. of periods required : 15

Academic standards

1. Conceptual Understanding:

- Explains about catenation property exhibited by carbon method of hybridization, allotropes of carbon, graphite, diamond, buckminsterfullerene, nanotubes, hydrocarbons, their relativities, functional group in carbon compounds method of nomenclature, products of soaps.
- Gives examples for different forms of carbon alkanes, alkenes, alkynes.
- Gives examples for carbon exhibiting catenation property and the functional groups changing the nature of substances.
- Differentiates between different carbon forms their oxidation and reduction reactions sp,sp^2, sp^3 identifies similarities between diamond- graphite, alkane - alkene.
- Analyses addition and substitution reactions of carbon compounds.

2. Asking questions and making Hypothesis:

- Questions to understand clearly nature of carbon catenation, method of nomenclature forms and structure of hydrocarbons.
- Makes hypothesis about different hydrocarbons based on functional groups and steps in nomenclature.
- Imagines the discoveries in future through catenation nature of carbon

3. Experimentation- Field Investigation:

- Conducts activities to understand foam of a soap cleansing micelle and its nature.
- Experiments on estarification.
- Names carbon compounds following the 11 steps, writes formula based on the name.
- Discusses the methods and stages of hybridization exhibited by carbon based on energy levels.

4. Information skills and Project:

- Prepares tables on catenation of carbon, formation of plenty of products like alkenes, alkynes etc.
- Prepares reports on modern aspects like nanotubes, their uses and discovery of graphic.
- Prepares a news letter about preparation and uses of ethyl alcohol displays and discusses.

5. Communication through drawing Pictures:

- Draws pictures of carbon catenation, hybridization, micelle, preparation of esters and explains about them.
- Prepares shapes of different hydrocarbons using beads and sticks based on nomenclature and exhibits them.
- Prepares flow charts on the preparation of hydrocarbons.

6. Appreciation and aesthetic sense - values:

- Appreciates formation of many substances by an element carbon through its nature ofcatenation.
- Congratulates the specialties of different atoms in reacting with carbon (Keeping in view the nomenclature)
- Identifies the greatness of carbon in producing a new substance and by products through a slight change.

7. Application to daily life and concern to bio-diversity:

- Identifies the importance and diversity of carbon displaying different types of relativities bestowing many benefits.
- Applies the concepts of chemical bonding and electronic configuration wherever necessary to understand carbon catenation.
- Co-ordinates the principle behind cleansing by soaps and the usefulness of bond angle and shape of water in cleansing.

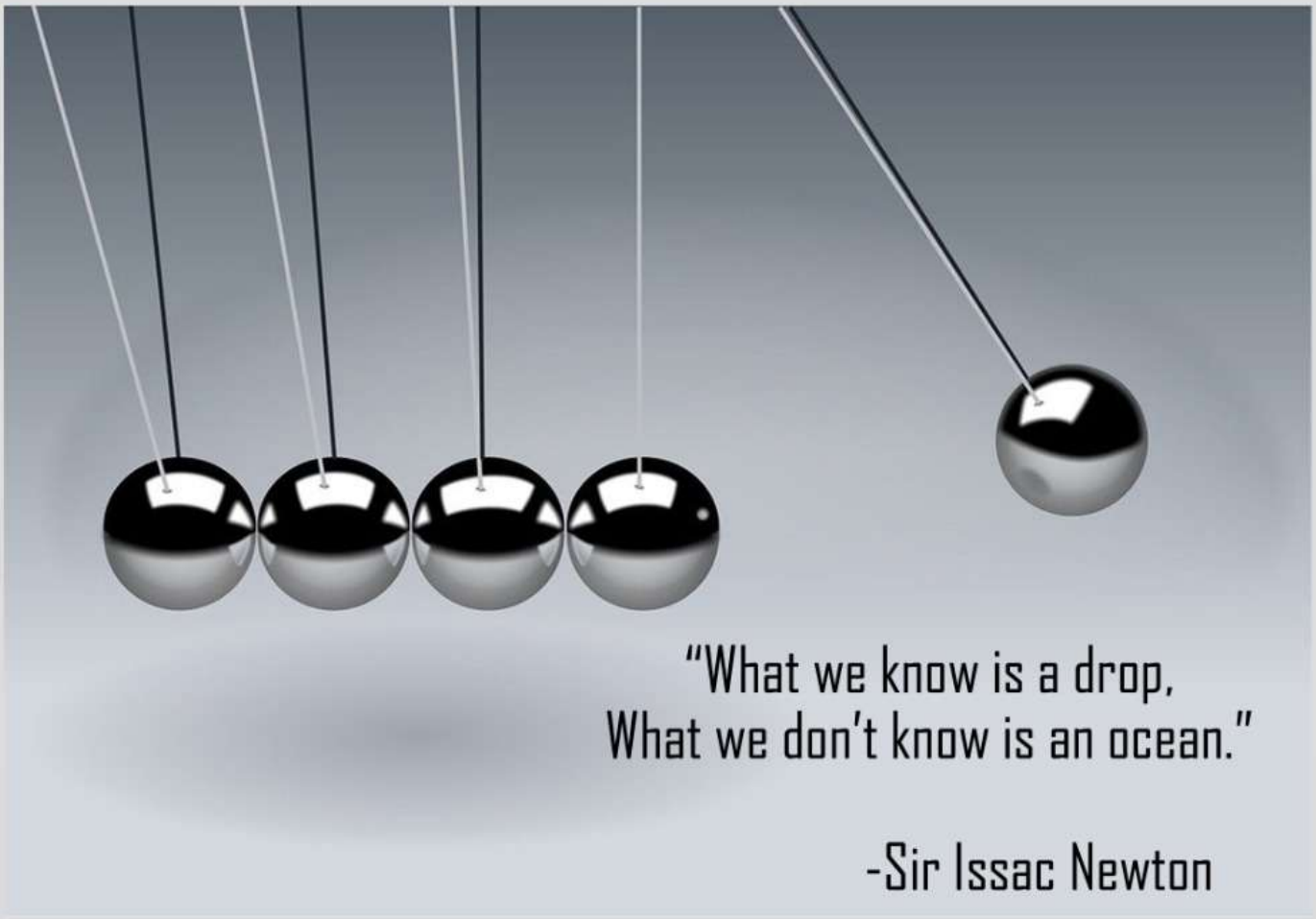
Period wise allotment:

Period	Content	Strategy	TLM/Resources	Evaluation
1	Carbon-valance-electron configuration-promotion of an electron	Brainstorming, Group discussion/ Individual Discussion Giving examples	Textbook Carbon electronic configuration Chart	1. Write the electronic configuration of carbon and mention the valence of the carbon.
2	Hybridization-SP Hybridization	Group discussion/ Individual Discussion Giving examples	Textbook Chart- SP hybridization diagrams	2. Explain SP Hybridization with example.
3	SP2-SP3 Hybridization	Group discussion /Individual Discussion Giving examples	Textbook Chart- SP^2, SP^3 hybridization diagrams	3. Explain SP^2 Hybridization with example. 4. Explain SP^3 Hybridization with example.
4	Allotropes of carbon	Group discussion/ Individual Discussion Giving examples	Textbook, Allotropes of carbons-Chart	5. Explain non crystalline allotropes of carbon and give examples.
5	Allotropes of carbon	Group discussion/ Individual Discussion Giving examples	Text book Allotropes of carbons-Chart	6. Explain crystalline allotropes of carbon and give examples.
6	Versatile nature of carbon	Group discussion/ Individual Discussion Giving examples	Textbook Chart	7. Explain isomerism with examples. 8. Explain catenation property with examples.
7	Hydrocarbons	Group discussion /Individual Discussion Giving examples	Textbook Chart	9. Mention the types of hydrocarbons.
8	carbon compounds with C,H,X-Functional groups in carbon compounds	Group discussion/ Individual Discussion	Textbook Chart	10. Mention the functional groups
9	Homologous series	Group discussion /Individual Discussion Examples	Textbook Homologous series - chart	11. Write the homologues series of Alkanes/alkenes/ alkynes.
10	Nomenclature of organic compounds-	Group discussion/ Individual Discussion	Textbook Naming priority tables chat.	12. Nomenclature with examples.

11	Nomenclature of organic compounds-	Group discussion /Individual Discussion examples	Textbook Bar Magnet, iron dust, white paper	13. Nomenclature with examples.
12	Chemical properties of carbon compounds	Group discussion/ Individual Discussion	Textbook	14. Explain the chemical properties of carbon compounds.
13	Some important carbon compounds- Estarification	Group discussion /Individual Discussion	Textbook	15. Explain the preparation of alcohol. 16. List out the material required to observe the estarification reaction and write the experimental procedure.
14	Soaps – sopanification- Micelle- cleansing action of soap	Group discussion/ Individual Discussion	Textbook	17. Explain the cleansing action of soap.
15	Left over topics in the what you have learnt questions. (Note: all topic related what you have learnt has been discussed in the relevant topic day only)	Group discussion/ Individual Discussion	Textbook Connecting wires, switch, Magnetic compass, Magnet	MCQ

Teacher's notes (additional resources)		
Period number	Teachers notes	Teacher signature with date

Teacher's Reflections		
Period number	Teachers reflections	Teacher signature with date



Steps in Teaching the Lesson:

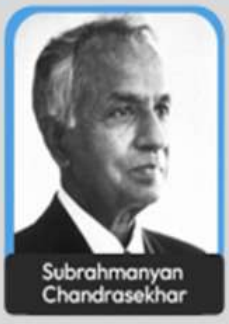
1. Introduction /perquisites (Mind mapping)
2. Reading the Lesson: keywords/key concepts/symbols/ formulae etc,
3. Conceptual understanding through pedagogical strategies.
4. Recapitulation/summary
5. Homework


Sir C.V. Raman


Satyendranath Bose


Meghnad Saha


Homi J. Bhabha


Subrahmanyan Chandrasekhar


Vikram Sarabhai


G.N Ramachandran


Jayant Narlikar


Harish Chandra


Sandip Chakrabarti