

Pre-Content/Content Post Content	Learning Outcomes/ Objectives	
	General	Specific
<u>Pre Content</u> • Classification of elements: They will recall from the previous class that elements can be classified into metals, non-metals and metalloids on the basis of their properties. <u>Content</u> • Classification of elements into metals and non-metals. • Chemical properties of metals and non - metals. • Reactivity series. • Electron dot structure • Ionic bonding • Extraction of metals • Corrosion. <u>Post Content</u> Students will be able to analyze the physical and chemical properties and appreciate the importance of metals and their alloys in our day to day live.	Students will be able to: • Classify metals and nonmetals on the basis of previous knowledge. • differentiate between metals and non-metals. • appreciate properties of metals and non-metals. • recall and tabulate the reactivity series. • recall the electronic configuration of elements, that every element has an atomic no. • compute the valency of element on the basis electronic configuration. • predict the nature of Ionic compounds • compare an ore and a mineral. • understand how different procedures are followed to extract a metal. • analyze effects of corrosion in daily life and apply various methods to prevent it. • appreciate the importance of extraction of metals and various methods used to extract metals.	Students will be able to: • List and name various metals and nonmetals used in our daily life. • compare the physical properties of metals and non-metals. • predict the outcome of reactions between metals and other compounds and non-metals and other compounds. • justify the nature and properties of metals and non-metals • predict the arrangement of metals in ascending and descending order according to the reactivity. • illustrate electronic configuration of elements. and draw electron dot structures of various compounds. • correlate valency and the type of bond. • perform activities to demonstrate the properties of ionic compounds. • analyze various separation techniques for the extraction. • list various steps involved in the extraction of metals. • identify factors responsible for corrosion. • propose various methods to prevent corrosion. • apply conceptual and experimental knowledge of metals in daily life.

•**Home work/ Assignments:** Question and Answers from NCERT textbook and worksheets.

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teacher will: show various metals and non-metals used in our daily life. Like Cu, Al,Zn ,I and S explain the difference between metals and non-metals on the basis of their physical properties. <u>ANNEXURE 3A</u> explain the difference between metals and non-metals on the basis of their chemical properties introduce the formation of ions and explain the formation of ionic compound through a video <u>ANNEXURE 3B</u> guide the students to perform the activity to demonstrate properties of ionic compounds. explain extraction of metals from their ores through a video explain electrolytic refining of copper through a video: <u>ANNEXURE 3C</u> guide the students to perform the activity based on corrosion.	Students will: identify metals and non-metals from the given samples, based on the class discussion. predict the physical properties of metals and non-metals . <u>ANNEXURE 3a</u> predict the chemical properties of metals and non-metals recall formation of ions from the concept learnt in class-IX and solve problem based questions. <u>ANNEXURE 3b</u> perform the activity and record the observations draw the flowchart depicting extraction of metals from its ore. draw the diagram depicting electrolytic refining of copper <u>ANNEXURE 3c</u> perform the activity to analyze factors affecting corrosion and complete the following worksheet.	

Teaching Aids: Samples of metals and non-metals, Activity Kits,Activities performed in the laboratory, activity worksheet, ICR,Internet, Reference books and text books.

Methodology/ Innovative Methods: Students identify the properties of metals and non metals by performing the activities & by observing them.

Interdisciplinary Links:History: The iron pillar near Qutub Minar.**Life Skills:** Preventing the loss of metallic objects by coating the metal with oil, grease and paints.

ANNEXURE3A,3a

ACTIVITY CHEMICAL PROPERTIES OF METALS AND NON-METALS

Class-X Duration-40mins

Nature of the Activity- Individual

Learning Outcome-

Students will be able to explore and infer the basic and acidic nature of Metallic and Non-metallic oxides.

What we have to do?

To demonstrate that Metallic oxides are basic in nature whereas Non-metallic oxides are acidic in nature

What do we require?

Magnesium ribbon, Sulphur powder, tongs, test-tube, test-tube holder, Burner, Blue litmus solution and Red litmus solution

What do we need to know?

Metals react with oxygen to form metallic oxides whereas Non-metals react with oxygen to form non-metallic oxides

How will you proceed?

➤ **Teacher's Activity**

Teacher will brief the activity and make the necessary arrangements for the activity.

➤ **Student's activity**

1. Take a Magnesium ribbon and some Sulphur powder.
2. Hold the magnesium ribbon with tongs and burn them on the burner.
3. Collect the ashes so formed and dissolve them in water.
4. Test the resultant solution with both Red Litmus Solution and Blue Litmus Solution

5. Record your observations/.

6. Heat a small amount of Sulphur powder in a clean and dry test tubes and invert another test tube over it.

What do we observe?

Sample	Red Litmus Solution	Blue Litmus Solution	Nature of the oxide
Metallic Oxide			
Non-Metallic Oxide			

What you have learnt?

Metallic Oxides are _____ in nature

Non-metallic Oxides are _____ in nature

EXTENDED LEARNING

What would you be interested to know?

1. What are amphoteric oxides?

2. How does a Metallic oxide react with an acid?

3. How does a Non-metallic oxide react with a base?

ANNEXURE 3B,3b

Teacher's Activity

Teacher will brief the activity and make necessary arrangements for the activity

Student's Activity

AIM:

To learn the properties of ionic compounds

MATERIAL REQUIRED:

Ionic compounds NaCl, KI and BaCl₂, a polar solvent-water, a non-polar solvent-Kerosene oil and test tubes

PROCEDURE:

Take water and kerosene, respectively in these test tubes and add NaCl to each of them. Record your observations.

Repeat the same procedure with KI and BaCl₂.

OBSERVATIONS:

S.NO	Sample	NaCl (soluble/insoluble)	KI (soluble/insoluble)	BaCl ₂ (soluble/insoluble)
1.	Polar Solvent			
2.	Non-Polar solvent			

CONCLUSION:

Ionic compounds are soluble in polar solvents and are insoluble in non-polar solvents.

ANNEXURE 3C,3c

CONDITIONS REQUIRED FOR RUSTING OF IRON

Subject	Science
Class	X
Chapter/Unit	Metals and Non-metals
Topic	Rusting of Iron
Time	4-5 days
Nature of Activity	Group

What will I learn (Learning Outcome)?

To analyze and conclude the conditions necessary for rusting of iron and infer the type of change taking place during the reaction.

Skills:

Evaluating and Creating

What I have to do?

To study the conditions under which rusting of iron takes place.

What do I require?

4 test tubes, 3 iron nails without any coating and 1galvanised iron nail, tap water, oil, calcium chloride and 3 corks to seal the mouth of the test-tubes.

What do I need to know?

Corrosion is a slow process of eating up of the metals by attack of air, moisture or any chemical. Rusting of Iron is a very common example of an oxidation reaction taking place in our surroundings in the presence of both oxygen and moisture.

➤ Teacher's Activity

Teacher will:

1. divide the students in group of four each and brief the activity
2. make the necessary arrangements for the activity.

How will I proceed?

➤ Student's Activity

1. Take four test tubes and place clean iron nails in test tube A, test tube B, test tube C respectively and galvanized nail in test tube D
2. Label these test tubes A, B, C and D

3. Pour some tap water in test tube A and seal it with the help of a cork.
4. Pour boiled distilled water in test tube B, add about 1 mL of oil and seal it with the help of a cork.
5. Put some anhydrous calcium chloride in test tube C and seal it with the help of a cork.
6. Pour some tap water in test tube D and seal it with the help of cork.
7. Leave these test tubes undisturbed for 4-5 days and then record your observations.

What have I observed?

S. No.	Test-Tube	Observations (undergoes rusting/does not undergo rusting)
1	Test-Tube A	Iron nail _____ in Test-Tube A
2	Test-Tube B	Iron nail _____ in Test-Tube B
3	Test-Tube C	Iron nail _____ in Test-Tube C
4	Test-Tube D	Galvanized iron nail _____ in Test-Tube D

What have I learnt?

Thus, I can conclude that rusting of iron takes place both in presence of _____ and _____.

What am I curious to learn?

- Let us take one spatula of Iron filings and add them to a clean and dry test-tube consisting of tap water. Leave it undisturbed for 4-5 days. Let's record observations of daily basis. Does Iron filing undergo the rusting process? Does it take the same amount of time as taken by an Iron nail?

Let me evaluate myself

Q1. Define rusting. How is the process different from Corrosion?

Q2. Predict the chemical equation depicting rusting of iron.

Q3. On what basis do you infer that rusting of iron is a chemical change?

Q4. What is the role of (a) oil in test tube B and (b) calcium chloride in Test-Tube C?

Q5. Justify the observation recorded in test-tube 4 with galvanized iron nail.
