

Pre-Content/Content Post Content	Learning Outcomes/ Objectives	
	General	Specific
<u>Pre Content</u> The students recall the importance of classification By connecting with previous knowledge of the concept done in class –IX Biology They associate the classification of elements into metals, non metals and metalloids. <u>Content</u> • Early attempts at the classification • Dobereniar’s Triads • Newland’s Law of Octaves • Mendeleev’s periodic table • Modern periodic table <u>Post Content</u> Recapitulate the Evolution of Periodic Table and discuss its achievements	Students will be able to: • arrange elements with similar properties into groups • correlate properties of elements into atomic masses. • construct a relationship between atomic masses of elements and their properties • develop the periodic law • correlate the properties of elements to their atomic numbers and electronic configuration • comprehend the evolution and the criteria underlying the various types of classification	Students will be able to: • arrange the elements in groups • identify the triads from the known elements. • calculate the atomic masses of the middle element. • give reason for the limitations of the Doberenier classification. • correlate the properties of the first element with the eighth. • compare the law of octaves to the octave found in the music. • identify the limitations of Newland’s Law of octaves. • select hydrogen and oxygen to write the formulae to find out the similarity in the elements. • choose elements with similar properties on the basis of their formula of oxides and hydrides. • arrange elements with increasing atomic masses and observe that there is a periodic recurrence. • analyze and predict the limitations of Mendeleev’s table. Position of isotopes and hydrogen • discover the salient features of the periodic table • appreciate the periodic trends in the properties of elements • predict the properties of elements from its position in the periodic table • calculate the number of valence electrons and the valency of an element. • compare the atomic sizes, electronegativity, metallic character etc across the period and along the group. • draw inference from the given data.

- **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: begin the chapter by discussing about the importance of classifying. summarize Döbereiner's Triads taking example of Lithium(Li), Sodium (Na) and Potassium (K) correlate Newland's Law of Octaves with seven notes of music and explain the Law. (Integration of Art) summarize the Mendeleev's Periodic table emphasizing on the two criteria of classification: Chemical properties of elements Atomic mass of the elements. <u>ANNEXURE 5A</u> assign one element to each student, prepare flashcards, facilitate in correlating periodic trends with the atomic number and distribution of electrons in the valence shells. <u>ANNEXURE5B</u> recapitulate the Modern Periodic Table by arranging 20 activity kits, each having a copy of the Periodic Table and Periodic Table Trends.	Students will: synthesize previous knowledge and list the importance of process of classifying apply and verify the law stated by Döbereiner by giving more examples identify Döbereiner's Triads from the given group of Triads. analyze the table formulated by Newland and conclude the limitations of the law. analyze the number of groups and columns and identify the limitations of Mendeleev's Periodic Table. <u>ANNEXURE 5a</u> analyze the information gathered apply the periodic trends correlate the periodic trends with the atomic number <u>ANNEXURE5b</u> interpret and analyze the division of table into rows and columns perform the activity and complete the Extended Learning Worksheet	

Teaching Aids: videos, science park, assignments, activity kits, activity worksheets and reference books..

Methodology/Innovative Methods: Newland's Law of Octaves to octave of musical scale.

Interdisciplinary links: Music: Correlated to musical notes.

Biology : show the importance of classification of elements as it is done in biology through the classification of the animal and plant kingdom

ANNEXURE 5A.5a

KNOWING MORE ABOUT SOME COMMON ELEMENTS

Subject	Science
Class	X
Chapter/Unit	Periodic Classification of the elements
Topic	Modern Periodic table
Time	45 minutes
Nature of Activity	Group

What will I learn (Learning Outcome)?

To apply the information gathered about the assigned element

Skills:

Analyzing, Creating and Applying

What I have to do?

To complete the missing information about the assigned element

What do I require?

Flashcards with missing information, pencil and eraser.

What do I need to know?

Each element in the periodic table displays 4 basic information, name of the element, symbol of the element, its atomic number and its atomic mass. Since atomic number is equal to the number of electrons in an atom, it further helps to write the electronic configuration of that element. By writing the electronic configuration of an element, we get to know the number of electrons in its valence shell. Valence electrons help in calculating the valency of that element.

Teacher's Activity

Teacher will:

1. prepare the flashcards of first 20 elements with missing information in each one of them as shown below in a few sample flashcards.
2. divide the class into 20 groups with 2 students in each group.
3. assign an element to each group and ask the students to research about the symbol, atomic number, atomic mass, atomic size, electronic configuration, valence electrons and valency of the assigned element.

4. on the day of the activity, the teacher will begin the activity by giving an **incomplete flashcard** of the assigned element to each group.
5. instruct the students to complete the missing information on the flashcard.
6. instruct the students to present the element assigned to them after writing the missing information,
7. instruct the groups with elements having 1 valence electron to form a common group, number the group as Group-1 and name it as **Alkali Metals**
8. instruct the groups with elements having 2 valence electrons to form a common group, number the group as Group-2 and name it as **Alkaline Earth Metals**
9. instruct the groups with elements having 7 valence electron to form a common group, number the group as group as Group-17 and name it as **Halogens**
10. instruct the groups with elements having 8 valence electron to form a common group, number the group as Group-18 and name it as **Noble gases**.

HELIUM

SYMBOL-

ATOMIC NUMBER:

ATOMIC MASS:

ELECTRONIC CONFIGURATION:

VALENCE ELECTRONS:

VALENCY:

METAL/NON-META/METALLOID

POTASSIUM

SYMBOL

TOMIC NUMBER:

ATOMIC MASS:

ELECTRONIC CONFIGURATION:

VALENCE ELECTRONS:

VALENCY:

METAL/NON-META/METALLOID

NITROGEN

SYMBOL-

ATOMIC NUMBER:

ATOMIC MASS:

ELECTRONIC CONFIGURATION:

VALENCE ELECTRONS:

VALENCY:

ATOMIC SIZE:

METAL/NON-META/METALLOID

CHLORINE

SYMBOL-

ATOMIC NUMBER:

ATOMIC MASS:

ELECTRONIC CONFIGURATION:

VALENCE ELECTRONS:

VALENCY:

ATOMIC SIZE:

METAL/NON-META/METALLOID

How will I proceed?

Student's Activity

1. Write the missing information about the assigned element with the help of pencil on the blank space provided on the flashcard by applying the information gathered about the assigned element.
2. after writing the missing information on the flashcard, each group will present the element assigned to them.
3. after the presentation about their assigned elements, each group will rearrange themselves into groups of the Modern Periodic table as per the teacher's instructions.

What have I observed?

S. No.	Name of the Element	Symbol	Atomic Number	Atomic Mass	Valence electrons	Electronic configuration	Valency	Metal/non-metal
1								

What have I learnt?

Therefore, I conclude that _____ is a more basic property of an element which helps in deciding the valency of the element and the _____ of the element in the periodic table.

What am I curious to learn?

- Let us arrange the elements of Group 1, Group 2, Group 17 and Group 18 vertically in the increasing order of their atomic numbers. How does the size of the elements change as you observe the elements from top to bottom in a group? What makes all the elements fall under a common group? Can you differentiate elements of Group 1 and Group 2 from the elements of Group 17 and Group 18.

Let me evaluate myself

Q1. State the Modern Periodic law.

Q2. How do valence electrons help in predicting the valency of an element and assigning a group number?

Q3. On the basis of the electronic configuration, can you justify why Noble gases are also called Inert gases?

Q4. After performing the activity can you justify why elements belonging to Group 1 and Group 2 are metals?

Q5. At the end of the activity, the flashcards of the elements from atomic number 3 to atomic number 10 were collected and arranged horizontally in the increasing order of their atomic numbers. What happens to the atomic size with increasing atomic number as we move from the element with atomic number 3 to the element with atomic number 10? Justify your answer on the basis of observation.

ANNEXURE 5 (B) AND 5(b.)

ACTIVITY -TO IDENTIFY AND UNDERSTAND THE PERIODIC TABLE TRENDS USING A PERIODIC TABLE

CLASS –IX

Duration-30mins

Nature of activity: Group

Learning outcome :

The students will be able to analyze, interpret and predict a chemical properties of few elements in the Periodic Table.

What we have to do?

To identify and understand the periodic table trends using a periodic table .

What is required?

A copy each of Periodic table of elements and periodic table trends

What do you need to know?

Periodic trends are specific patterns that are present in the periodic table that illustrate different aspects of a certain element, including its size and its electronic properties. Major periodic trends include: [electronegativity](#), [ionization energy](#), [electron affinity](#), [atomic radius](#), melting point, and [metallic character](#). Periodic trends, arising from the arrangement of the periodic table, provide chemists with an invaluable tool to quickly predict an element's properties. These trends exist because of the similar atomic structure of the elements within their respective group families or periods, and because of the periodic nature of the elements.

How will you proceed ?

➤ **Teacher' s activity**

Teacher will explain about the periodic trends and arrange 20 kits, each having a worksheet and a copy each of Periodic table of elements and Periodic table trends.

➤ **Student's activity**

Students will observe both the tables and will try to attempt each question using the knowledge they have about the periodic trends and the copy of the trends.

S.No.	Property of the elements	Position in the periodic table	Reason
1	Electronegative nature of Fluorine		
2	Less Ionisation energy of Sodium		
3	Inert nature of Argon		
4	Hydrogen behaves as both Alkali metals and halogens		
5.	Lanthanoids and Actinoids are not part of the periodic table.		

What you have learnt?

As you move down a group on the periodic table, the electronegativity of an element decreases becausenumber of **energy** levels puts the outer electrons very far away from the pull of the nucleus.

Electronegativity..... as you move from left to right across a period on the periodic table.
The more negative the electron affinity value, the higher an atom's affinity for electrons.

What you would be interested in?

Electron affinity increases from left to right within a period. Why?

What is the difference between ionic radius and atomic radius?

Where are radioactive elements located in the periodic table?
