

Pre-Content/Content Post Content	Learning Outcomes/ Objectives	
	General	Specific
Pre-content: - To recall that the sour and bitter tastes of food is due to the presence of acids and bases in these substances. Content: ➤ Classification of matter into Acids and Bases ➤ Chemical properties of acids and bases ➤ pH scale ➤ Salts - Preparation - Chemical and Common names - Water of crystallization - Uses - pH of various salts Post-content: recapitulation of important definitions and chemical reactions.	The students will be able to: recall the physical properties of acids and bases. differentiate between into acids and bases on the basis of their chemical properties. analyze the chemical properties of acids and bases correlate the pH to acidic, basic, or neutral nature of substances. associate formation of salts to neutralization Recall the important definitions and chemical reactions.	The students will be able to: classify the food items into acids and bases using indicators. differentiate between Natural and Synthetic indicators demonstrate the chemical properties of acids and bases. compare the properties of acids and bases identify what is common between acids and bass analyze the behavior of acids and bases in water identify the strength of acids and bases using universal indicator apply pH in daily life. substitute names of salts by their formula. identify the acid and base from which they are formed. tabulate the salts into their families. justify the various uses. comprehend the process involving the formation of salts predict the uses of the salts

HOME WORK / ASSIGNMENTS:

- Students will be given questions from the NCERT text book
- Worksheets from Assignment booklet

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial
Teacher will: <u>ANNEXURE 2A(i)</u> provide various samples to students to test their acidic or basic nature using natural Beetroot indicator. <u>ANNEXURE 2A(ii)</u> provide various samples to students to test their acidic or basic nature using synthetic indicator. <u>ANNEXURE 2B</u> demonstrate the reaction of dil. HCl with Metal carbonate and hydrogen carbonate <u>ANNEXURE 2C</u> demonstrate the reaction of dil. HCl and NaOH with Zinc explain "What all Acids and Bases have in common" reaction through a video <u>ANNEXURE 2D</u> demonstrate the behaviour of acids and bases in water. <u>ANNEXURE 2E</u> demonstrate the nature of salts using universal pH indicator. divide the class into 6 groups and give one salt to each group	Students will: <u>ANNEXURE 2a(i)</u> perform the activity and tabulate the colour change. <u>ANNEXURE 2a(ii)</u> perform the activity and tabulate their colour change. <u>ANNEXURE 2b</u> perform the activity and record observations. <u>ANNEXURE 2c</u> perform the activity and record the observations. observe the video shared and solve problem based questions <u>ANNEXURE 2d</u> perform the activity and complete the following worksheet <u>ANNEXURE 2e</u> perform the activity and complete the following worksheet present the given salt as a group activity	

Teaching Aids: Teaching indicators, samples of weak and strong acids, bases, salts, pH paper, CuSO₄ crystals, ICR, internet, reference books, charts

Methodology/Innovative Methods: First the activities are performed and then the children or the students discovered the properties of acids, bases and salts. Then similarly, the students also discovered the pH various substances

Interdisciplinary Links: Life skills – pH related to daily life. Using home remedies for insect bites, acidity in the stomach, caries in the teeth. Environment–Acid rain disturbs the aquatic organisms due to the decrease in the pH value of water. Acidic and basic soils are not suitable for the growth of cro

ANNEXURE 2A(i),2a(i)

ACTIVITY-NATURAL INDICATORS

Class-X

Duration-40mins

Nature of the Activity- Group

Learning Outcome-

Students will be able to explore and identify the colours produced by acidic and basic solutions using a Natural Indicator.

What we have to do?

To identify the acidic and basic nature of the given substances using Beetroot extract.

What do we require?

Beetroot, Mortar, Water, Beaker (25ml) Tripod stand, Burner, Filter Paper, Funnel, micro test tubes, dropper, Lemon Juice, Soda-Water, Vinegar , Coffee Solution and Baking Soda

What do we need to know?

Indicators are chemical substances which give different colour in acidic and basic mediums

How will you proceed?

➤ Teacher's Activity

Teacher will brief the experiment, form 8 groups and make arrangements for the required apparatus and chemicals

➤ Student's Activity

1. Crush Beetroot in a mortar.
2. Add sufficient water to obtain the extract.

3. Heat the extract in a Beaker for about 7-10mins.
4. Collect the filtrate in a separate beaker using a filter paper and funnel.
5. Take four Micro Test Tubes and arrange them in a test tube stand. Label them A, B, C and D
6. Pour 1ml of Lemon Juice, Soda-Water, Vinegar and Baking Soda solution in them respectively.
7. Put 2-3 drops of Beetroot extract in each test tube and record your observations.

What do we observe?

Test-Tube	Colour developed after adding Beetroot Solution
A	
B	
C	
D	
E	

What have you learnt?

Vinegar is _____ in nature

Soda Water is _____ in nature

Lemon Juice is _____ in nature

Baking Soda is _____ in nature

EXTENDED LEARNING WORKSHEET

What would you be interested to know?

1. What are the various types of Indicators?

2. What is an Olfactory Indicator?

3. Is Litmus a Natural or Synthetic Indicator?

4. Is there any plant which is naturally acidic or basic in nature?

Annexure 2A(ii)

Teacher's Activity

Teacher will provide various samples to students to test their acidic or basic nature of the sample and analyze their effect of every sample on the indicator used.

Annexure 2a(ii)

Student's Activity

As students will perform the activity, they will observe about the change in the colour of indicator with various samples and mention in the table below.

S.No.	Indicator used	Methyl Orange	Phenolphthalein	Blue Litmus	Red Litmus
1.	HCl				
2.	CH ₃ COOH				
3.	NaOH				
4.	NH ₄ OH				
5.	NaHCO ₃				

Annexure 2(B)

Teacher's Activity

Teacher will demonstrate the reaction of dil. HCl with Sodium carbonate and Sodium hydrogen carbonate.

Annexure 2 (b)

Student's Activity

Students will perform the activity and record observations in the table below.

S.No.	Reaction	Product formed
1.	HCl+ Sodium carbonate	

2.	HCl+ Sodium hydrogen carbonate	
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Annexure 2(C)

Teacher's Activity

Teacher will demonstrate the student the reaction of Zinc granules with dil. HCl and NaOH.

Annexure 2 (c)

Student's Activity

Students will perform the activity and record the observations in the table given below.

S.No.	Reaction	Products formed
1.	Zinc+ HCl	
2.	Zinc+ NaOH	

ANNEXURE 2D,2d

BEHAVIOUR OF ACID IN AQUEOUS MEDIUM

Subject	Science
Class	X
Chapter/Unit	Acids, Bases and Salts
Topic	What happens to an acid in water solution?
Time	45 minutes
Nature of Activity	Group

What will I learn (Learning Outcome)?

To analyze that the acidic character of any acid is due to formation of hydrogen ions in aqueous medium.

Skills:

Analyzing and Applying

What I have to do?

To study the acidic character of Hydrogen Chloride gas in aqueous medium with the help of blue litmus paper.

What do I require?

2 Test tubes, 1 Beaker (10mL) Potassium Chloride (KCl) salt, conc. Sulphuric acid (H_2SO_4), water, and Blue Litmus paper.

What do I need to know?

Acids are chemical substances which dissociate to produce Hydrogen (H^+) ions or Hydronium (H_3O^+) ions in the aqueous medium. Since water is a polar solvent, it dissociates an acid to produce Hydrogen (H^+) ions. These H^+ ions further combine with water molecules to form Hydronium ions (H_3O^+)

➤ Teacher's Activity

Teacher will:

1. brief the experiment, divide the class into 8 groups with 4 students in each group.
2. make arrangements for the required apparatus and chemicals and instruct the important precautions to the students.

Caution: *the activity requires use of conc. sulphuric acid, therefore, should be performed strictly under the supervision of a teacher*

Note to teachers: *If the climate is very humid, you will have to pass the gas produced through a guard tube (drying tube) containing calcium chloride to dry the gas.*

How will I proceed?

➤ **Student's Activity**

1. Take about 1g of solid KCl in a clean and dry test tube.
2. Keep small amount of water ready in the 10mL beaker.
3. Add some concentrated sulphuric acid to the test tube slowly by the sides of the test-tube with the help of a dropper.
4. Observe the gas evolving from the test-tube.
5. Test the gas evolved with dry litmus paper.
6. Record your observation.
7. Test the gas evolved successively with the help of wet blue litmus paper by dipping the same litmus paper in water taken in the 10mL beaker.
8. Record your observations

What have I observed?

S. No.	Blue Litmus paper	Reaction of Dry Hydrogen Chloride gas (Colour changes OR No Colour change)
1.	Dry	
2.	Wet	

What have I learnt?

Thus, I conclude that as Hydrogen Chloride gas turns blue litmus to _____ in only in presence of _____.

What am I curious to learn?

- Let us take a small amount of Ammonium Chloride in a test-tube and add a small amount of Sodium Hydroxide to it. Now, test the evolved gas with dry and wet (i) red litmus paper and (b) blue litmus paper. What will I observe?

Let me evaluate myself:

Q1. Define Acids

Q2. Why does Hydrogen Chloride gas formed in the above activity produces a colour change only in aqueous medium?

Q3. What will happen if the Hydrogen Chloride gas produced in the above activity is allowed to pass through Methyl Orange.

Q4. Predict the chemical equations when Hydrogen Chloride gas is dissolved in water.

Q5. A student dissolved the Hydrogen Chloride gas in water to prepare a solution. She took a small amount of this solution in a beaker and tried passing electricity through it. What will she observe?

ANNEXURE 2E,2e

ARE SALTS ALSO ACIDIC OR BASIC IN NATURE?

Subject	SCIENCE
Class	X
Chapter/Unit	Acids, Bases and Salts
Topic	Salts
Time	45 minutes
Nature of Activity	Group

What will I learn (Learning Outcome)?

To analyze the acidic, basic and neutral nature of salts.

Skills:

Analyzing and Applying

What I have to do?

To analyze the acidic, basic and neutral nature of the given salts by checking their pH using a pH paper.

What do I require?

Dry salt samples of sodium chloride, zinc sulphate, copper sulphate, sodium acetate and sodium carbonate, distilled water, 5 test-tubes, 5 droppers, universal pH paper strips and standard colour chart.

What do I need to know?

Acids react with bases to form salt and water. This reaction is also known as Neutralization Reaction.

➤ Teacher's Activity

Teacher will:

1. recapitulate the concept of Neutralization reaction.
2. brief the activity, divide the children in groups of 5 each and make necessary arrangements for the activity.

How will I proceed?

➤ Student's Activity

1. Take small amount of sodium chloride, zinc sulphate, copper sulphate, sodium acetate and sodium carbonate in 5 clean and dry test-tubes and label them as A, B, C, D and E respectively.
2. Add small amount of distilled water to the salts taken in the 5 test-tubes and mix the contents.
3. Take a strip of Universal pH indicator and cut it into 5 pieces.
4. Put 1-drop of each salt solution on each of the cut pieces and analyze the pH of the solution using the standard colour chart.
5. Record your observations and try to identify the acid or base used to form the salt.

What have I observed?

S. No.	Salt	pH	Acid used	Base used
1	sodium chloride			
2	zinc sulphate			
3	copper sulphate			
4	sodium acetate			
5	sodium carbonate			

What have I learnt?

Salts of a strong acid and a strong base are neutral with pH value of _____. On the other hand, salts of a strong acid and weak base are acidic with pH value _____ than 7 and those of a strong base and weak acid are basic in nature, with pH value _____ than 7.

What am I curious to learn?

- Let us take samples of salts like aluminium chloride, potassium carbonate, potassium acetate and check their pH value. What do you infer about the nature of the salts?
- Let us add equal amounts of sodium hydroxide to hydrochloric acid in a test-tube. Mix the contents well and check the pH of the resultant mixture. Which type of reaction is this? What will be the product formed? What can be inferred about the nature of the product formed?

Let me evaluate myself

Q1. What do you understand by the term pH?

Q2. Why is the Neutralization reaction called so?

Q3. Write down the chemical equations for the reactions taking place in the above activity.

Q4. How is pH related to hydrogen ion concentration?

Q5. Ritika added small amount of Magnesium hydroxide is added to dil. HCl taken in test-tube **A** and CH_3COOH in test-tube **B**. Predict the nature of the salt formed in the test-tubes **A** and **B** using a Universal Indicator.
