

LESSON PLAN
SUBJECT - SCIENCE
CLASS - 9

CONSOLIDATED PLAN

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
No. of Periods	Total: 7 periods (approx. 40 min each)
Learning Objectives	1. Students will be able to define the term Pure substance and its types. 2. Students will be able to define the term Mixture and its types. 3. Students will be able to define the term Mixture and its types. 4. Students will be able to define the terms :Compounds and Mixture. 5. Students will be able to explain the properties of solution. 6. Students will be able to calculate the concentration of solution. 7. Students will be able to explain properties of suspension. 8. Students will be able to describe the nature of colloid and its types. 9. Students will be able to describe the methods used to separate different components of a mixture. 10. Students will be able to define the terms - Physical Change and Chemical Change.
Teaching Aids / Resources	Teaching Video Explanation Video Experiential Learning Video PPT Concept Map

Previous Knowledge/ Curiosity Questions	Q.1 Define matter? Ans. Matter is a thing which has mass and occupies space . Q.2. A substance has a definite volume but no definite shape. State whether this substance is a solid , a liquid or a gas? Ans. Liquid. Q3. What are the components of milk? Ans. Water,Fat,Protein etc. Q4. Is water a pure substance or a mixture? Ans. Milk is a mixture.
Announcement of topic	On finding that the students were unable to answer last two questions, the teacher would announce that the students have already studied basic concept of pure substance and mixture in previous classes. Today, we will begin with the Chapter - Is Matter Around Us Pure, in which the Concepts related to Pure substance, Mixtures and the different methods used to separate components of a mixture will be done.

Teaching Methodology/ Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning-Short Answer Type Questions Q1. Define the term mixture? Q2. Differentiate between Homogeneous and Heterogeneous mixture? Q3.Differentiate between Saturated and unsaturated Solutions ? Q4. Name the process which is used to separate different components of ink? Q5.Name the process which is used to separate two immiscible liquids? 2. Active learning- Explanation of the Content will be started with real life examples of pure substance and mixtures followed by power point Presentation. Students will easily grasp the nature of mixture and comparison of different types of Mixtures . 3. Group learning- It fosters discussion which is essential for understanding in science. Students will perform experiments collaboratively to understand the separation of components by sublimation and by using separating funnel which develops critical thinking. 4. Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom.
Content Obligatory Vocabulary (Keywords)	Homogeneous,Heterogeneous, Saturated, Unsaturated, True Solutions, Colloids, Suspension, Tyndall effect, Concentration, Evaporation,Boiling, condensation, sublimation, deposition, Fractional distillation, Crystallisation, Physical Change,Chemical Change.

Learning Concepts/ Teaching Points	1. Pure substance and its types. 2. Mixture and its types. 3. Mixture and its types 4. Compounds and Mixture. 5. Properties of solution. 6. calculation of the concentration of solution. 7. Properties of suspension. 8. colloid and its types. 9. Methods used to separate different components of a mixture. 10. Physical Change and Chemical Change.
Hard Spots/ Focus Spots	Note : Students find difficult to understand the concept of calculating the Concentration of solution. Reason : Students find difficult to understand the difference in dilute and concentrated Solutions. Students may get confused between concentration and density.
Experiential Content	Activity 1.- Separation Of components by evaporation. Activity 2. - Separation Of components by centrifugation. Activity 3. - Separation Of components by using separating funnel. Activity 4. - Separation Of components by sublimation. Activity 5. - Separation Of components by Chromatography.
Subject Enrichment Activities for Internal Assessment	1. To draw flow chart of different types of pure substance and mixture. 2. Observe daily life activities- Separating fat from milk, Separating oil from water.

Recapitulation :	Q1. Define the term mixture? Q2. Differentiate between Homogeneous and Heterogeneous mixture? Q3. Differentiate between Saturated and unsaturated Solutions ? Q4. Name the process which is used to separate different components of ink? Q5. Name the process which is used to separate two immiscible liquids? Q6. Differentiate between true solution, colloid and Suspension? Q7. Differentiate between Physical and Chemical Change?
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Assignment: LOTS	LOTS Very Short Answer Type Questions 1. Give one example each of homogeneous and heterogeneous mixture. 2. Name the apparatus by which mixture of oil and water can be separated. 3. How can we check whether the given solid substance is pure or not? Short Answer Type Questions 1. A hard substance produces a tinkling sound when beat. Is it metal or a non-metal? 2. Is brass a mixture or a compound? 3. What type of solution is an alloy? Liquid solution or solid solution 4. A mixture consisting of two miscible liquids 'A' and 'B' whose boiling points differ by 50 °C can be separated by which process? In fractional crystallisation two organic compounds get differentiated on the basis of which property? 5. Which method can be used to separate mixture of iron filings and common salt? 6. Give one example of solid-liquid homogeneous mixture. 7. Which method is used to separate two immiscible liquids? 8. Name two elements which are in liquid state at room temperature? Long Answer Type Questions 1. List five characteristics by which compounds can be distinguished from mixtures? 2. What is chromatography? Explain by giving principle involved. State its important applications.
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Assignment: HOTS	HOTS Q.1. Identify the following as homogeneous or heterogeneous matter. Gasoline, , dirt, smog, alcohol, iron nail, vinegar, aerosol spray, air, sea water. Ans. Gasoline :homogeneous Dirt:heterogeneous Smog:heterogeneous Alcohol homogeneous Iron nail:heterogeneous Vinegar :homogeneous Aerosol pray:heterogeneous Air :homogeneous Sea water:homogeneous Q 2. Classify the following as physical change or chemical change. i. Burning of magnesium ribbon in air ii. Burning of sulphur in air iii. Electrolysis of water iv. Purification of copper sulphate from impure copper sulphate by crystallisation v. Preparation of sugar solution vi. Conversion of milk into curd vii. Evaporation of alcohol viii. Burning of coal Ans. i. Burning of magnesium ribbon in air: Chemical change ii. Burning of sulphur in air: Chemical change iii. Electrolysis of water: Chemical change iv. Purification of copper sulphate from impure copper sulphate by crystallisation: Physical change v. Preparation of sugar solution: Physical change vi. Conversion of milk into curd: Chemical change vii. Evaporation of alcohol: Physical change viii. Burning of coal: Chemical change
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PERIOD - ONE

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
Period Number	One (approx. 40 min each)
Learning Objectives	1. Students will be able to define the term Pure substance and its types.
Teaching Aids / Resources	Explanation Video Experiential Learning Video PPT
Previous Knowledge/ Curiosity Questions	Q.1 Define matter? Ans. Matter is a thing which has mass and occupies space . Q.2. A substance has a definite volume but no definite shape. State whether this substance is a solid , a liquid or a gas? Ans. Liquid. Q3. What are the components of milk? Ans. Water,Fat,Protein etc. Q4. Is water a pure substance or a mixture? Ans. Milk is a mixture.
Announcement of topic	On finding that the students were unable to answer last two questions, the teacher would announce that the students have already studied basic concept of pure substance and mixture in previous classes. Today, we will begin with the Chapter - Is Matter Around Us Pure, in which the Concepts related to Pure substance, Mixtures and the different methods used to separate components of a mixture will be done.

Teaching Methodology/ Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning- Q1. Define the terms: element, compound? 2. Compare the properties of metal, non metal and semi Metal? 3. Compare the properties of an element and a compound? 4. 2. Active learning- Students get engaged in learning process, increasing understanding and memory. Explanation of the Content will be started with real life examples of solid, liquid and gases followed by power point Presentation. Students will easily grasp the nature of Matter. 3. Group learning- It fosters discussion which is essential for understanding in science. Students will perform experiments to understand the particulate nature of Matter. It develops collaboration, critical thinking and creativity skills in students. 4. Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom.
Content Obligatory Vocabulary (Keywords)	Element, compound, metal, semi metal, nonmetal.

Learning Concepts/ Teaching Points	Pure Substance A pure substance is one which is made up of one kind of particles. Types of Pure Substances Pure substances are classified as elements and compounds Elements An element is a substance which can not be split up into two or more simpler substances. It is made up of only one kind of particles. Elements are further characterised as Metals, Non-Metals and Metalloids Metals – Silver, Mercury, Copper, Gold 1. Metals are lustrous (shiny) 2. Metals conduct heat and electricity 3. Metals have a silver-grey or gold-yellow colour 4. We can hammer metals and form thin sheets (Malleability) 5. We can convert metals into wires (Ductility) 6. Metals always produce a ringing sound if they are hit (Sonorous) Non-Metals – Carbon, Iodine, Chlorine, Oxygen, Hydrogen 1. Non-Metals do not conduct heat and electricity 2. Non-Metals are not sonorous, lustrous or ductile 3. Non-Metals have varied colours Metalloids – Silicon, Germanium They show some properties of metals and some of the non-metals. Compounds A compound is a substance which is made up of two or more elements chemically combined in a fixed ratio by mass. A compound can be broken into two or more elements but not by physical processes. For Example, Ammonium Sulphate, Sulphur Chloride, Water.
Experiential Content	1. Make a list of metals and nonmetals? (Five each)

Subject Enrichment Activities for Internal Assessment	1.To draw flow chart of different types of pure substance and mixture.
Recapitulation :	1. Define the terms: element, compound? 2. Compare the properties of metal, non metal and semi Metal? 3. Compare the properties of an element and a compound?
Assignment:	1. Define the terms: element, compound? 2. Compare the properties of metal, non metal and semi Metal? 3. Compare the properties of an element and a compound?

PERIOD- TWO

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
Period Number	TWO (approx. 40 min each)
Learning Objectives	1. Students will be able to define the terms :Compounds and Mixture. 2. Students will be able to explain the properties of solution.
Teaching Aids / Resources	Explanation Video Experiential Learning Video PPT

Previous Knowledge/ Curiosity Questions	1. Define the terms: element, compound? Ans. An element is a substance which can not be split up into two or more simpler substances. It is made up of only one kind of particles. A compound is a substance which is made up of two or more elements chemically combined in a fixed ratio by mass. A compound can be broken into two or more elements but not by physical processes. 2. A hard substance produces a tinkling sound when beat. Is it metal or a non-metal? Ans. Metal 3. Is brass a mixture or a compound? Ans. Mixture.
Announcement of topic	On finding that the students were unable to answer last question, the teacher would announce that the students have already studied basic concept of pure substance and mixture in previous classes. Today, we will begin with the topic compounds and mixture. Properties of solution will also be done.

Teaching Methodology/ Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning- It allows students generate a large number of ideas. Q1.Which state has definite shape? Q2. Which state has indefinite volume? Q3. In which state, kinetic energy of particles is maximum? Q4. In which state, the rate of diffusion is maximum? 2. Active learning- Students get engaged in learning process, increasing understanding and memory. Explanation of the Content will be started with real life examples of solid, liquid and gases followed by power point Presentation.Students will easily grasp the comparison of properties of solid, liquid and gas. 3. Group learning-It fosters discussion which is essential for understanding in science. Students will perform experiments to compare rate of diffusion of different states of Matter in collaboration. 4.Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom.
Content Obligatory Vocabulary (Keywords)	Homogeneous,Heterogeneous, Saturated, Unsaturated, True Solutions, Colloids, Suspension, Tyndall effect, Concentration, Evaporation,Boiling, condensation, sublimation, deposition, Fractional distillation, Crystallisation, Physical Change,Chemical Change.

Learning Concepts/ Teaching Points

Mixture

A mixture is composed of two or more elements or compounds in any ratio. It shows the properties of the components. The components can be separated by physical methods

Classification of mixture:

1. Depending upon nature of components-
Homogeneous mixture and Heterogeneous mixture
2. Depending upon concentration- Saturated solution and unsaturated solution
3. Depending upon particle size- True solution, Colloid and Suspension

Homogeneous Mixtures and Heterogeneous Mixtures.

Homogeneous Mixtures. It is a mixture which has a uniform composition.

Eg. Mixture of sugar in water, Mixture of salt in water, Mixture of copper sulphate in water

Heterogeneous Mixtures

It is a mixture which does not have a uniform composition. Eg. Mixture of sand in water, Mixture of sulphur and iron filings, Mixture of oil and water.

True Solutions

A solution is nothing but a uniform mixture of two or more substances. Homogeneous Mixtures are solutions.

Solution of -

- Liquid into liquid: Water and Ink
- Solid into solid: Alloys
- Gas into gas: Air
- Solid into liquid: Sugar and Water
- Solid into gas: Hydrogen and Metals
- Liquid into gas: Carbon Dioxide and Water

What is an alloy?

An alloy is a mixture of different metals or non-metals and metals that cannot be separated from each other using physical methods. For Example:

Brass – Copper with up to 50% zinc

Bronze – Copper with up to 12% tin

Learning Concepts/ Teaching Points	Solvent – The substance in which another substance is mixed is called the Solvent. For Example, Water is a solvent in which we can mix different substances such as salt or sugar. Solute – The substance that is added to the solvent to form a solution is called a Solute. For Example, Salt, when mixed in water, acts as a solute for the mixture. Properties of a Solution: • A solution is a homogenous mixture. • We cannot see the particles of a solution through naked eyes as they are as small as 1 nanometer in diameter. • The path of light is not visible through the solution. The particles of a solution do not scatter light through them as they are extremely small. • We cannot separate the particles of a solution by methods of filtration.
Subject Enrichment Activities for Internal Assessment	Compare solid, liquid and gas on the basis of their shape, volume and rigidity?
Recapitulation :	• Which of these is a mixture or a pure substance? Water, Copper, Chocolate cake, Hydrogen, Soil, Air Ans. Mixture – Chocolate cake, Soil, Air Pure substance – Water, Copper, Hydrog Classification of mixture

Assignment:	1. Differentiate between homogeneous and Heterogeneous mixtures with examples? Ans- Homogenous Mixtures. It is a mixture which has a uniform composition. Eg. Mixture of sugar in water, Mixture of salt in water, Mixture of copper sulphate in water Heterogeneous Mixtures It is a mixture which does not have a uniform composition. Eg. Mixture of sand in water, Mixture of sulphur and iron filings, Mixture of oil and water. 2. What is alloy? Give examples. Ans- An alloy is a mixture of different metals or non-metals and metals that cannot be separated from each other using physical methods. For Example: Brass – Copper with up to 50% zinc Bronze – Copper with up to 12% tin
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PERIOD- THREE

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
Period Number	THREE (approx. 40 min each)
Learning Objectives	1. Students will be able to calculate the concentration of solution. 2. Students will be able to explain properties of suspension.
Teaching Aids / Resources	Explanation Video Experiential Learning Video PPT

Previous Knowledge/ Curiosity Questions	Q1. What is homogeneous mixture ? Ans- Homogenous Mixtures. It is a mixture which has a uniform composition. Eg. Mixture of sugar in water, Mixture of salt in water, Mixture of copper sulphate in water Q. 2. What is Heterogeneous Mixture? Ans. It is a mixture which does not have a uniform composition. Eg. Mixture of sand in water, Mixture of sulphur and iron filings, Mixture of oil and water. Q3. What is alloy? Give examples. Ans- An alloy is a mixture of different metals or non-metals and metals that cannot be separated from each other using physical methods. For Example: Brass – Copper with up to 50% zinc Bronze – Copper with up to 12% tin
Announcement of topic	On finding that the students were unable to answer last question, the teacher would announce that the students have already studied basic concept of solution in previous classes. Today, we will begin with the topic related to calculation of concentration of solution. Properties of suspension will also be done.

Teaching Methodology / Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning- Q.1.36 GMs Of sodium chloride is dissolved in 100 GMs Of water at 293K. Find its concentration. Ans- Mass is solute= 36 g Mass of solution = 36+100= 136 g. Concentration = $36 \times 100 / 136 = 26.47\%$. Q2. Define the term concentration? Ans- Concentration refers to the amount of a substance per defined space or can be defined as the ratio of solute in a solution to either solvent or total solution. 2. Active learning- Students get engaged in learning process, increasing understanding and memory. Explanation of the Content will be started with real life examples of solid, liquid and gases followed by power point Presentation. Students will easily grasp the comparison of properties and inter conversion of states of matter . 3. Group learning- It fosters discussion which is essential for understanding in science. Students will be asked to draw a flow chart to show inter conversion of three states of matter. Students will also be asked to tabulate the properties of solid, liquid and gas in collaboration. 4. Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom.
Content Obligatory Vocabulary (Keywords)	Saturated solution , Unsaturated solution , True Solutions, Suspension, Concentration,

**Learning
Concepts/
Teaching Points**

Unsaturated and Saturated Solutions

- Unsaturated Solution – A solution, in which we can add more amount of solute as it has not achieved its saturation level yet, is called an Unsaturated Solution. A dilute solution can be called as an Unsaturated Solution.
- Saturated Solution – A solution in which no more solute can be added since it has already dissolved the maximum amount of solute it can is called a Saturated Solution.

Focus Spot :

In dilute solution the concentration of the solute is much less than that of the solvent. For Example, If we mix 1gm of salt in 500 ml of water, the salt solution thus obtained will be diluted. If we keep on adding the solute in a solution there comes a point when no more solute dissolves in the solution. This is called the Saturation Point of a Solution.

concentration

Concentration refers to the amount of a substance per defined space or can be defined as the ratio of solute in a solution to either solvent or total solution.

To calculate the concentration consider the formulae below:

- Percent by Mass = $(\text{Mass of solute} / \text{Mass of solution}) \times 100$
- Percent by Volume = $(\text{Volume of solute} / \text{Volume of solution}) \times 100$

What is a suspension?

A suspension is formed when two or more substances are mix in a non-uniform manner.

- We cannot separate the particles of a colloid through filtration. We use a method called Centrifugation to separate the particles of a colloid.

Learning Concepts/ Teaching Points Continues.	• Properties of Suspensions: • A suspension is a heterogeneous mixture. • We can see the particles of suspensions through naked eyes. • We can see the path of light through the particles of a suspension. • The particles of suspension tend to settle down when left undisturbed. Then, they can be separated using filtration.
Subject Enrichment Activities for Internal Assessment	Students will be asked to solve numericals.
Recapitulation :	1. What are Saturated and unsaturated Solutions? Ans- Unsaturated Solution – A solution, in which we can add more amount of solute as it has not achieved its saturation level yet, is called an Unsaturated Solution. A dilute solution can be called as an Unsaturated Solution. • Saturated Solution – A solution in which no more solute can be added since it has already dissolved the maximum amount of solute it can is called a Saturated Solution. 2. 36 GMs Of sodium chloride is dissolved in 100 GMs Of water at 293K. Find its concentration. Ans- Mass is solute= 36 g Mass of solution = 36+100= 136 g. Concentration = $36 \times 100 / 136 = 26.47\%$ 3. Define the term concentration? Ans- Concentration refers to the amount of a substance per defined space or can be defined as the ratio of solute in a solution to either solvent or total solution.
Assignment:	Solve the NCERT intext numericals to calculate concentration of solution.

PERIOD- FOUR

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
Period Number	FOUR (approx. 40 min each)
Learning Objectives	1. Students will be able to describe the nature of colloid and its types.
Teaching Aids / Resources	Teaching Video PPT
Previous Knowledge/ Curiosity Questions	1. What are Saturated and unsaturated Solutions? Ans- Unsaturated Solution – A solution, in which we can add more amount of solute as it has not achieved its saturation level yet, is called an Unsaturated Solution. A dilute solution can be called as an Unsaturated Solution. • Saturated Solution – A solution in which no more solute can be added since it has already dissolved the maximum amount of solute it can is called a Saturated Solution. 2. Define the term concentration? Ans- Concentration refers to the amount of a substance per defined space or can be defined as the ratio of solute in a solution to either solvent or total solution.
Announcement of topic	On finding that the students were unable to answer last question, the teacher would announce that the students have already studied basic concept of concentration of solution in previous classes. Today, we will begin with the topic colloid and its types.

Teaching Methodology/ Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning- Q. Classify the following as true solution, suspension and colloid. Sugar syrup, chalk powder in water, salt solution, soap solution, blood. Ans- Sugar syrup- True solution, Chalk powder in water- Suspension, Salt solution- True solution, Soap solution and blood- Colloid 2. Active learning- Students get engaged in learning process, increasing understanding and memory. Explanation of the Content will be started with real life examples of solid, liquid and gases followed by power point Presentation. Students will easily grasp the concept of melting point and boiling point. 3.Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom. 6. Peer learning- Students receive more time for individualised learning. Peers strengthen their own learning by instructing others.
Content Obligatory Vocabulary (Keywords)	Colloids, Tyndall effect, Dispersed phase, Dispersion medium.

**Learning Concepts/
Teaching Points**

Colloidal solution

A colloidal solution or a colloid is a uniform solution of two or more substances. The particles are relatively very small that the solution appears as a homogeneous mixture but it is not.

Properties of colloids:

- Colloids are heterogeneous in nature.
- The particles of a colloid cannot be seen through naked eyes.
- The particles scatter a beam of light passed through a colloid and produce Tyndall effect.
- Colloids are stable in nature. The particles of colloids do not settle down if left uninterrupted.
- We cannot separate the particles of a colloid through filtration. We use a method called Centrifugation to separate the particles of a colloid.

Tyndall Effect

When a beam of light is passed through a colloid the particles of the colloid scatter the beam of light and we can see the path of light in the solution. For Example, when a ray of light enters a dark room it is scattered by the dust particles present in the air and we can see the path of light clearly.

Classification of Colloids

Dispersed Phase – The dispersed particles or the solute-like components in a colloid

Dispersing Medium – The substance in which these solute-like particles are added

Based on the state of the dispersing medium colloids are classified as:

Colloid Type 1. Solid sol- Dispersion medium and dispersed phase are solids Eg. Alloy

2. Sol- Dispersion medium is liquid, dispersed phase is solid Eg. Paint, ink.

3. Aerosol - Dispersion medium is gas Dispersed phase is solid Eg. Smoke

4. Gel- Dispersion medium is solid dispersed phase is liquid Eg. Curd

5. Emulsion - Dispersion medium and dispersed phase are liquids Eg. Milk

	6. Liquid aerosol-Dispersion medium is gas Dispersed phase is liquid Eg. Cloud 7. Solid foam- Dispersion medium is solid dispersed phase is gas Eg. Cork 8. Foam- Dispersion medium is liquid dispersed phase is gas Eg. Sulphide ore
Recapitulation :	1. Classify the following as true solution, suspension and colloid. Sugar syrup, chalk powder in water, salt solution, soap solution, blood. Ans- Sugar syrup- True solution, Chalk powder in water- Suspension, Salt solution- True solution, Soap solution and blood- Colloid 2. Define the term Tyndall effect? Ans- When a beam of light is passed through a colloid the particles of the colloid scatter the beam of light and we can see the path of light in the solution. For Example, when a ray of light enters a dark room it is scattered by the dust particles present in the air and we can see the path of light clearly. 3. Define the terms dispersed phase and Dispersion medium? Ans- Dispersed Phase – The dispersed particles or the solute-like components in a colloid Dispersing Medium – The substance in which these solute-like particles are added
Assignment:	Differentiate between true solution, suspension and Colloid.?

PERIOD - FIVE

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
Period Number	FIVE (approx. 40 min each)
Learning Objectives	1. Students will be able to describe the methods used to separate different components of a mixture.
Teaching Aids / Resources	Teaching video
Previous Knowledge/ Curiosity Questions	1. Classify the following as true solution, suspension and colloid. Sugar syrup, chalk powder in water, salt solution, soap solution, blood. Ans- Sugar syrup- True solution, Chalk powder in water- Suspension, Salt solution- True solution, Soap solution and blood- Colloid 2. Define the term Tyndall effect? Ans- When a beam of light is passed through a colloid the particles of the colloid scatter the beam of light and we can see the path of light in the solution. For Example, when a ray of light enters a dark room it is scattered by the dust particles present in the air and we can see the path of light clearly. 3. Define the term Dispersion medium? Ans. Dispersing Medium – The substance in which these solute-like particles are added.
Announcement of topic	On finding that the students were unable to answer last two questions, the teacher would announce that the students have already studied basic concept of colloids in previous classes. Today, we will begin with the topic related to different methods used to separate components of a mixture will be done.

Teaching Methodology/ Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning- 1.State the condition for using the method of centrifugation to separate components of a mixture? - Ans- The substances with different densities are separated by centrifugation. 2.State the principle involved in centrifugation? - Ans- Denser substances moves outward Whereas less dense moves to the centre. 3.Which technique is used to separate sodium chloride from water? - Ans- Evaporation 2. Active learning- Students get engaged in learning process, increasing understanding and memory. Explanation of the Content will be started with real life examples of evaporation and its cooling effects.Students will easily grasp the factors affecting evaporation and its cooling effect. 3. Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom.
Content Obligatory Vocabulary (Keywords)	Evaporation, centrifugation, sublimation, Chromatography.
Learning Concepts/ Teaching Points	Methods to separate components of mixture 1.Evaporation – This Method is used for separating a volatile component(solvent) from a non volatile component (solute) by heating the mixture Eg. Mixture of salt and water, mixture of sugar and water, mixture of Dye and water (ink) 2. Centrifugation – This Method is used to separate denser particles and lighter particles from a mixture by using a centrifugal machine Eg. The cream is separated from milk because cream is less dense than milk 3. Using a Separating funnel – This Method is used to separate a mixture of immiscible liquids by using a separating funnel Eg. Mixture of oil and water

Learning Concepts/ Teaching Points	Procedure: The immiscible liquids are allowed to settle in the funnel. The components soon form separate layers due to different densities. The first liquid is allowed to flow out of the funnel and as soon as it is completely poured out, the stopcock is closed thereby separating the two liquids from each other. 4. Sublimation-This Method is used to separate a mixture of a substance which undergoes sublimation from a non-sublimable component. Eg.. Ammonium chloride / camphor / naphthalene and salt. Procedure: Heat the mixture in an inverted funnel so that the sublimable component sublimes in the air and settles over the walls of the funnel and the non-sublimable component, on the other hand, is left behind 5. Chromatography – This Method is used for separating coloured component from a liquid by using a filter paper Eg. Components of an ink, components of dye, drugs from blood. Procedure: Take a filter paper or a blotting paper and place a drop of ink at the rear end. Dip the end in water. Since ink is a mixture of two or more colors, the component of ink which is soluble in water mixes into it and then separates quickly from the other components that are less soluble in water.
Experiential Content	Activity 1.- Separation Of components by evaporation. Activity 2. - Separation Of components by centrifugation. Activity 3. - Separation Of components by using separating funnel. Activity 4. - Separation Of components by sublimation. Activity 5. - Separation Of components by Chromatography.

Recapitulation :	1. State the condition for using the method of centrifugation to separate components of a mixture? Ans- The substances with different densities are separated by centrifugation 2. State the principle involved in centrifugation? Ans- Denser substances moves outward Whereas less dense moves to the centre 3. Which technique is used to separate sodium chloride from water? Ans- Evaporation
Assignment:	State the principles involved in following methods- Evaporation, Centrifugation, Using Separating funnel, Chromatography?

PERIOD - SIX

Chapter Number and Title of Chapter	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
Period Number	SIX (approx. 40 min each)
Learning Objectives	1. Students will be able to describe the methods used to separate different components of a mixture by distillation and by Crystallisation. 2. Students will be able to define the terms - Physical Change and Chemical Change.
Teaching Aids / Resources	Explanation Video Experiential Learning Video PPT Concept Map

Previous Knowledge/ Curiosity Questions	1. State the condition for using the method of centrifugation to separate components of a mixture? Ans- The substances with different densities are separated by centrifugation 2. State the principle involved in centrifugation? Ans- Denser substances moves outward Whereas less dense moves to the centre 3. Which technique is used to separate sodium chloride from water? Ans- Evaporation
Announcement of topic	On finding that the students were not able to answer last question ,the teacher told the students that we have already discussed the methods to separate different methods and announced that today, we will discuss distillation, fractional distillation, Physical and Chemical Change.
Teaching Methodology/ Strategy	Transaction would proceed in the following manner- Suggestive Methodologies: 1. Brain Storming / Curiosity Questioning- Q. Classify the following as physical change or chemical change. i. Burning of magnesium ribbon in air ii. Burning of sulphur in air iii. Electrolysis of water iv. Purification of copper sulphate from impure copper sulphate by crystallisation v. Preparation of sugar solution. 2. Active learning- Students get engaged in learning process, increasing understanding and memory. Explanation of the Content will be started with real life examples of plasma. Students will easily understand the Conversion of degree Celsius into Kelvin scale, Conversion of Kelvin scale into degree Celsius, Plasma and BEC, Basic Measurable Quantities and their S.I. Units. 3.Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom.
Content Obligatory Vocabulary (Keywords)	Physical change, chemical change, distillation

Learning Concepts/ Teaching Points	Simple Distillation – This Method is used for separating a mixture of miscible liquids by boiling the mixture and condensing the vapours. It is used to separate the components having sufficient difference in their boiling points. Eg. Acetone and water. Procedure : The mixture is heated in a distillation apparatus. The one substance with lower boiling point evaporates first, condenses and gets separated from the one with a higher boiling point. Fractional Distillation- It is used for separating a mixture of two or more miscible liquids whose difference in boiling points is less than 25K. Eg. Components of petroleum, different gases from air Separation of gases from air by fractional distillation Air is compressed by increasing the pressure and cooled by decreasing the temperature to get liquid air. The liquid air is then allowed to warm up in a fractionating column. Then the different components are separated at different levels depending upon their boiling points. Purification of solids by crystallisation- Crystallisation is the Processes separating a pure solid in the form of crystals from its solution. Eg. pure copper sulphate from solution. Physical and Chemical Change: In Physical Change, the molecules are rearranged while their actual composition remains same.eg. Freezing of water, melting of wax, boiling of water. In a Chemical Change, the molecular composition of a substance completely changes and a new substance is formed.eg. Burning, cooking, rusting.
Subject Enrichment Activities for Internal Assessment	To make a list of Physical and Chemical changes?

Recapitulation :	Q.. Classify the following as physical change or chemical change. - i.Burning of magnesium ribbon in air - ii.Burning of sulphur in air - iii.Electrolysis of water - iv.Purification of copper sulphate from impure copper sulphate by crystallisation - v.Preparation of sugar solution - vi.Conversion of milk into curd - vii.Evaporation of alcohol - viii.Burning of coal Ans.i.Burning of magnesium ribbon in air: Chemical change - ii.Burning of sulphur in air: Chemical change - iii.Electrolysis of water: Chemical change - iv.Purification of copper sulphate from impure copper sulphate by crystallisation: Physical change - v.Preparation of sugar solution: Physical change - vi.Conversion of milk into curd: Chemical change - vii.Evaporation of alcohol:Physical change - viii.Burning of coal: Chemical change
Assignment:	To solve NCERT intext and back exercise.

FOCUS SPOT

CHAPTER	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
TOPIC/CONCEPT	Concentration of solution.
FOCUS SPOT	Students find difficult to understand the concept of calculating the Concentration of solution.
WHY	Reason : Students find difficult to understand the difference in dilute and concentrated Solutions. Students may get confused between concentration and density.
IMPACT	Students will not be able to calculate the concentration of solution. Students find difficult to understand the difference in dilute and concentrated Solutions. Students may get confused between concentration and density.

EXPERIENTIAL LEARNING ACTIVITY- 1

CHAPTER	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
TOPIC/CONCEPT	Separation Of components by evaporation.
NAME OF THE ACTIVITY	To separate salt from saline.
TYPE OF ACTIVITY	Group Activity
LEARNING OUTCOME	This Method is used for separating a volatile component(solvent) from a non volatile component (solute) by heating the mixture .
PROCEDURE/ METHODOLOGY	This Method is used for separating a volatile component((water) from a non volatile component (salt) by heating the mixture .
QUESTIONS	Give example of a mixture whose components can be separated by evaporation?
SOLUTIONS/ HINTS	Sugar from water, dye from water,

EXPERIENTIAL LEARNING ACTIVITY- 2

CHAPTER	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
TOPIC/CONCEPT	Separation Of components by centrifugation.
NAME OF THE ACTIVITY	To separate cream from milk.
TYPE OF ACTIVITY	Group Activity

LEARNING OUTCOME	This Method is used to separate denser particles and lighter particles from a mixture by using a centrifugal machine
PROCEDURE/ METHODOLOGY	The cream is separated from milk because cream is less dense than milk by using centrifugal machine.
QUESTIONS	Give example of a mixture whose components can be separated by centrifugation?
SOLUTIONS/ HINTS	Precipitates from solution

EXPERIENTIAL LEARNING ACTIVITY- 3

CHAPTER	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
TOPIC/CONCEPT	Separation Of components by using separating funnel.
NAME OF THE ACTIVITY	To separate kerosene oil from water.
TYPE OF ACTIVITY	Group Activity
LEARNING OUTCOME	This Method is used to separate a mixture of immiscible liquids.
PROCEDURE/ METHODOLOGY	◦ The immiscible liquids are allowed to settle in the funnel. The components soon form separate layers due to different densities. The first liquid is allowed to flow out of the funnel and as soon as it is completely poured out, the stopcock is closed thereby separating the two liquids from each other.
QUESTIONS	Give example of a mixture whose components can be separated by Using separating funnel?
SOLUTIONS/ HINTS	Any oil from water (Two immiscible components)

EXPERIENTIAL LEARNING ACTIVITY- 4

CHAPTER	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
TOPIC/CONCEPT	Activity 4. - Separation Of components by sublimation.
NAME OF THE ACTIVITY	To separate camphor and salt.
TYPE OF ACTIVITY	Group Activity
LEARNING OUTCOME	Camphor undergoes sublimation where as salt does not.
PROCEDURE/ METHODOLOGY	Heat the mixture in an inverted funnel so that the sublimable component sublimates in the air and settles over the walls of the funnel and the non-sublimable component, on the other hand, is left behind.
QUESTIONS	Give example of a mixture whose components can be separated by Sublimation?
SOLUTIONS/ HINTS	Ammonium chloride or Naphthalene from salt

EXPERIENTIAL LEARNING ACTIVITY- 5

CHAPTER	Chapter No. - 2 Title of the Chapter - Is Matter Around Us Pure.
TOPIC/CONCEPT	Separation Of components by Chromatography.
NAME OF THE ACTIVITY	Separation of different components of ink.
TYPE OF ACTIVITY	Group Activity
LEARNING OUTCOME	This Method is used for separating coloured component from a liquid by using a filter paper depending upon their adsorption tendencies.
PROCEDURE/ METHODOLOGY	Take a filter paper or a blotting paper and place a drop of ink at the rear end. Dip the end in water. Since ink is a mixture of two or more colors, the component of ink which is soluble in water mixes into it and then separates quickly from the other components that are less soluble in water.
QUESTIONS	Give example of a mixture whose components can be separated by Chromatography?
SOLUTIONS/ HINTS	Coloured pigments, drugs from blood.

