

# CHEMISTRY - CLASS 06

## Theme 01: Introduction to Chemistry

Chemistry finds applications in day-to-day life as well as in industries. Chemicals from simple to complex, are used in food, medicines, cosmetics, textile industry, agriculture, cleansing agents, etc. This theme will help children understand applications of Chemistry in their lives.

### Learning Outcomes:

Children will be able to:

1. Discuss the importance of Chemistry in daily life and its role in different industries and life processes;
2. List important applications of Chemistry in day to day life;
3. List some industrial applications of Chemistry;
4. Discuss the bio-sketches of some great scientists and their works;
5. Appreciate the patience, perseverance, sacrifices and ethical conduct of scientists

## Theme 02: Elements, Compounds and Mixtures

All materials / objects found around us are either in solid, liquid or gaseous form and occupy space and have mass. In science, the term matter is used for all these materials. Chemically, matter can be classified as element, compound and mixture. In nature, matter occurs mostly in the form of mixture. Importantly, substances are required in their pure form that is done by the separation of the components of a mixture by different techniques. The use of any particular separation technique depends upon the properties of the components of the mixture.

### Learning Outcomes:

Children will be able to:

1. Define elements as made up of identical atoms;
2. Classify elements as metals and non-metals on the basis of their properties;
3. Define compound and mixture and discuss the points of difference between the two;
4. Use symbols of elements and molecular formulae of the compounds to represent their names as shorthand notations;
5. Separate different components of samples of some mixtures;
6. Discuss the reasons for opting for a particular technique for separation of components of the mixture.

## Theme 03: Matter

This theme focuses on enabling children to understand that matter around exists in different physical forms. i.e. solids, liquids and gases. One form can be converted into another. Matter expands on heating and on cooling, it contracts. Besides the physical changes, matter can also undergo chemical changes on heating.

### Learning Outcomes:

Children will be able to:

1. Discuss the properties of solids, liquids and gasses;
2. Classify the matter into solid, liquid and gas;
3. Discuss the inter-conversion of one state of matter into another;
4. Explain the effect of heat on matter showing change of state, expansion and chemical change.

## Theme 04: Water

The theme focuses on enabling children to understand that water is essential for sustenance of life. It is considered as a universal solvent due to its capacity to dissolve a large number of compounds in it. They will also appreciate that water is becoming scarce day by day and therefore it is important to use it judiciously, conserve it and keep our water resources clean.

### Learning Outcomes:

Children will be able to:

1. Define 'solute', 'solvent' and 'solution';
2. Infer that solution is a homogeneous mixture of solute and solvent;
3. Discuss different examples of solutions;
4. State reasons for pollution of water resources and suggest ways to conserve water.

## Theme 05: Air and Atmosphere

This theme will enable children to know about the atmosphere around us and what air consists of and its importance. Air which is a mixture of different gases such as nitrogen, oxygen, helium, carbon dioxide, argon, moisture. Air is essential for sustenance of life on earth. They will also appreciate the need to keep air clean and that they should take the responsibility of making it free of pollutants.

### Learning Outcomes:

Children will be able to:

1. Describe different components of air and their composition;
2. State the importance of air for sustenance of life and for other physical and chemical processes;
3. Describe the uses of oxygen and nitrogen;
4. Discuss the causes of increase of carbon dioxide into the atmosphere.

### Annual Plan for Class VI Chemistry

Month	Date	Name of lessons /Chapter No	No of class required
June	Chapter 1 (6/6/22-17/6/22)	Chapter-1 Introduction to Chemistry	8

July	Chapter 1 (4-8)	Chapter-1 Introduction to Chemistry	2
August	(1-23)	Chapter -3	3
		<b>II Term</b>	
September	12-30	Chapter-3	8
October	Chapter 5 (3-28)	Chapter-2	6
November	Chapter 9 (1-29)	Chapter-2	8
December	1-9	Chapter-3	2
		<b>III Term</b>	
January	3-25	Chapter-3	8
February	1-28	Chapter-4	8
March	1-7	Chapter-5	4

<b>Marking Scheme- I Mid- Term</b>				
<b>No</b>	<b>Class</b>	<b>Subject</b>	<b>Chapter No/ Chapter name</b>	<b>Marks</b>
1	VI	Chemistry		
			Chapter -1	25
Total				25
<b>Marking Scheme- I- Term</b>				
<b>No</b>	<b>Class</b>	<b>Subject</b>	<b>Chapter No/ Chapter name</b>	<b>Marks</b>
1	VI	Chemistry	Chapter-1	40
Total				40
<b>Marking Scheme- II Mid- Term</b>				
<b>No</b>	<b>Class</b>	<b>Subject</b>	<b>Chapter No/ Chapter name</b>	<b>Marks</b>
1	VI	Chemistry		
			Chapter -2	12
			Chapter -3	13
Total				25
<b>Marking Scheme II Term</b>				

<b>No</b>	<b>Class</b>	<b>Subject</b>	<b>Chapter No/ Chapter name</b>	
1	VI	Chemistry		
			Chapter -2	25
			Chapter -3	30
			Chapter -4	25
Total				80

**Annual Marking Scheme VI Class Chemistry**

<b>No</b>	<b>Class</b>	<b>Subject</b>	<b>Chapter No/ Chapter name</b>	<b>Marks</b>
1	VI	Chemistry	Chapter-1	5
			Chapter -2	5
			Chapter -3	5
			Chapter -4	5
			Chapter-5	15
			Chapter-6	20
			Chapter-7	20
			Chapter- 8	5
Total				80

# CHEMISTRY - CLASS 07

## Theme 01: Matter and its Composition

This theme focuses on informing and making children aware of the different types of matter/objects found in their surroundings such as stones, water, soil, oil, sugar, air. Some of them have common characteristics in terms of states, some are solids, liquids and some are gases. These states vary in their shape, volume and texture. All these are made up of some materials which have mass and occupy space. Children will also realize that the study of their composition is of great importance in their daily lives.

### **Learning Outcomes:**

Children will be able to:

1. Describe matter;
2. Discuss the constituents (atoms/molecules) of matter;
3. Explain the forces which keep atoms/molecules in matter together.

## Theme 02: Physical and Chemical Changes

The theme focuses on informing children and making them aware about the different types of changes physical and chemical that are regularly observed occurring in the environment. Some occur on their own and some are caused due to human activities to meet their requirements. Keeping in view the unending role of these changes, it becomes worthwhile that children learn about them.

### **Learning Outcomes:**

Children will be able to:

1. Differentiate between physical and chemical changes;
2. Perform activities related to physical and chemical changes;
3. Classify changes such as respiration, preparation of solution of sugar, burning of paper ripening of fruit, spoiling of food materials as physical and chemical changes;
4. Discuss that in a chemical change, a new substance with different properties is formed.

## Theme 03: Elements, Compounds and Mixtures

This theme will enable children to understand that the earth mainly consists of mixtures containing elements and compounds. These are of different types and many a times the separation of components of mixtures is required for practical utility. They

**will also know about and discuss the different techniques for separation of the components of a mixture to get the pure components.**

**Learning Outcomes:**

Children will be able to:

1. Identify elements and compounds on the basis of their properties and the type of atoms present in them;
2. Differentiate between mixtures and compounds on the basis of their properties and composition of constituents;
3. Provide examples of elements, compounds and mixtures from daily life;
4. Discuss different techniques for separation of components of mixtures;
5. Justify the reason for the use of a particular technique in separation of a mixture;
6. Explain chromatography and its importance.

## **Theme 04: Atomic Structure**

**This theme will enable children to understand that every matter is made up of tiny particles known as atoms and molecules. Molecules are also made up of atoms. Hence atoms are the building blocks of matter. The physical and chemical properties of matter are governed by atoms. Therefore, the knowledge of the concepts of atoms of elements, molecules of elements and compounds and radicals of compounds is necessary to understand different processes and principles of Chemistry.**

**Learning Outcomes:**

Children will be able to:

1. Define atom, molecule and radical;
2. Discuss the significance of valency of elements and radicals;
3. Define valency in terms of number of hydrogen atoms combined or replaced by one atom of the element;
4. Apply the definition based on hydrogen atom to find out the valency of other elements and radicals;
5. Correlate the valency of the elements with group number of periodic table

## **Theme 05: Language of Chemistry**

**Chemistry involves the study of a large number of elements and compounds that also have been learnt earlier with their representation by their short hand notations i.e. symbols and formulae. This theme will enable children to understand that it is not convenient to write the full names of the elements and compounds, and the use of symbols has made the job of the chemists much easier. In addition, they will further realize that Chemistry also involves the occurrence of a large number of chemical reactions that are written in the form of equations known as chemical equations. The writing of chemical equations involves writing of reactants and products as their symbols and formulae. Thus symbols and formulae have also made writing of chemical equations in Chemistry very convenient.**

**Learning Outcomes:**

Children will be able to:

1. Identify the names of reactants and products of different chemical reactions;
2. Write a chemical reaction in the form of a chemical word equation;

3. Recognize the usefulness of a word equation.

## Theme 06: Metals and Non-Metals

In day-to-day life many elements are commonly found such as iron, aluminium, zinc, lead, chlorine, carbon, sulphur etc. and their compounds. The elements have been classified in two classes, namely metals and non-metals. In this theme children will learn the classification of elements as metals and non-metals on the basis of their properties.

### Learning Outcomes:

Children will be able to:

1. Differentiate between metals and nonmetals on the basis of their physical properties such as luster, conduction of electricity and heat, malleability, ductility, sonority, melting point, boiling point, density, strength;
2. Describe common uses of some of the metals and non-metals;
3. Describe the cause of corrosion of iron and other metals;
4. List different ways of preventing corrosion of metallic articles used in daily life;
5. List some properties and uses of metalloids.

## Theme 07: Air and Atmosphere

Air is a mixture of some gaseous components which have wide use in daily life. For example, nitrogen is an important constituent of fertilizers and oxygen is essential for our body for sustenance of life. These gases have important physical and chemical properties and uses.

### Learning Outcomes:

Children will be able to:

1. Review that air is a mixture of gasses;
2. Recall the components of air;
3. Discuss the use of oxygen and nitrogen in different life processes;
4. Explain from an activity that mass change takes place on combustion;
5. Express the reaction in the form of word equation;
6. Describe the preparation of oxygen in the laboratory using potassium chlorate/ hydrogen peroxide and manganese dioxide as a catalyst;
7. Understand the concept of catalyst.

Days	Chapters
June 6th to July 20th	Matter and its composition
June 21st to July 8th	Changes in the world around us
July 18th to August 20th	Separation of substances
September 12th to September 30th	Atomic structure
October 6th to October 21st	Language of Chemistry



November 3rd to November 18th	Characteristics of chemical reactions
November 21st to December 12th	Air and its constituents
January 3rd to January 23rd	Oxygen and oxides
January 24th to March 8th	Metals and non-metals

Exam	Marks	Lessons	Chapter's name	Mark division
First midterm examination	25	Chapter 1	Matter and its composition	10
		Chapter 2	Changes in the world around us	15
First terminal examination	40	Chapter 1	Matter and its composition	12
		Chapter 2	Changes in the world around us	14
		Chapter 3	Separation of substances	14
Second midterm examination	25	Chapter 4	Atomic Structure	12
		Chapter 5	Language of Chemistry	13
Second terminal examination	80	Chapter 4	Atomic Structure	25
		Chapter 5	Language of Chemistry	25
		Chapter 6	Characteristics of chemical reactions	30
Annual examination	80	Chapter 1,2,3(first term)		20
		Chapter 4,5,6(second term)		20
		Chapter 7		
		Chapter 8	Air and its constituents	16
		Chapter 9	Oxygen and oxides Metals and non-metals	12

## CHEMISTRY - CLASS 08

### Theme 01: Matter

In earlier classes, Matter was introduced and discussed as composed of atoms/molecules and that it is found in the forms of solids, liquids and gases. In this class the aim of the theme is to enable children to understand that these states are compared on the basis of inter particle state and inter particle collision. The Kinetic theory of matter will be introduced to explain the change of state. They will understand that in a physical and chemical change, the total mass before and after the change remains the same which is known as the law of conservation of mass. Explanation of this theory and law would help them in understanding other behaviour of matter.

**Learning Outcomes:**

Children will be able to:

1. Describe the main postulates of the kinetic theory of matter;
2. Explain the reason of change of one state of the matter to another and vice-versa on the basis of inter particle space and inter particle attraction and collision;
3. Define and explain the law of conservation of mass using an example.

## **Theme 02: Physical and Chemical Changes**

This theme will enable children to understand that there are different types of changes in our surroundings which as slow/fast, reversible/irreversible, periodic/non-periodic and physical/chemical. In physical changes, no new substance is formed while in chemical change, a new substance with properties different from the element forming that substance is formed. Learning of these changes will also help in developing different scientific skills amongst them.

**Learning Outcomes:**

Children will be able to:

1. Illustrate different changes occurring in nature with examples learned in previous classes;
2. Perform some activities to show some well-known changes;
3. Differentiate between physical and chemical changes and classify the changes.

## **Theme 03: Elements, Compounds and Mixtures**

In previous classes, children were informed about the classification of matter into – elements, compounds and mixtures. Mixture is an important class of matter as most of the matter in nature is found in the form of mixture. In this class children will be enabled to understand that there are various techniques by which components of mixture can be separated.

**Learning Outcomes:**

Children will be able to:

1. Recall previous knowledge related to elements, compounds and mixtures;
2. Classify substances into elements, compounds and mixtures on the basis of their properties;
3. Perform activities to separate components of a mixture;
4. Explain the principle involved in using a particular technique in separating a mixture.

## **Theme 04: Atomic Structure**

**This theme focuses on developing children's understanding about the atom as the building block of all types of matter. Therefore, in science, it becomes important to know about the atom and its structure.**

**In fact, everything on this earth is made up of atoms. It is the atom of an element that takes part in chemical reactions.**

**Learning Outcomes:**

Children will be able to:

1. Describe that an atom consists of electrons, protons and neutrons;
2. Define atomic number and mass number;
3. Discuss valency of elements and radicals with respect to the number of hydrogen atoms combining with one atom of the element.

## **Theme 05: Language of Chemistry**

**In previous classes, discussions about the symbols of elements and the formulae of compounds help in expressing their long names as short-hand notations which forms the language of Chemistry. In this class children will develop the ability to derive the Formulae of compounds if symbols of elements/radicals forming the compound and their valencies are known. They will also be able to write chemical equations if the reactants and products and their symbols/ formulae are known to them.**

**Learning Outcomes:**

Children will be able to:

1. Recall the symbols of different elements;
2. Derive the formulae of compounds on the basis of valencies of elements and radicals;
3. Write chemical equation of a reaction;
4. Balance chemical equations by applying the law of conservation of mass

## **Theme 06: Chemical Reactions**

**This theme will enable children to understand that several oxides, carbonates and hydrates on heating are converted to other compounds. Oxides of metals and non-metals have basic and acidic character respectively. They will also realize and appreciate that there are different types of reactions such as combinations, decomposition, displacement, double displacement, exothermic and endothermic reactions.**

**Learning Outcomes:**

Children will be able to:

1. Describe different types of chemical reactions with examples;
2. Identify the type of chemical reaction;
3. Identify different oxides as basic, acidic, amphoteric and neutral;
4. Explain the effect of heat on oxides of some metals.

## **Theme 07: Hydrogen**

**This theme focuses on enabling children to know about one gas- Hydrogen and that it is an important constituent of several compounds. It is found in acids and organic compounds. It acts as a fuel which makes its study useful.**

### **Learning Outcomes:**

Children will be able to:

1. Describe the preparation of hydrogen from electrolysis of water;
2. Prepare hydrogen in the lab. using zinc and acid;
3. Describe properties and uses of hydrogen;
4. Correlate concepts of oxidation and reduction with addition and removal of oxygen or removal and addition of hydrogen.

## **Theme 08: Water**

**Water is the one of the most important resources and is a universal solvent. Children will know and understand that water is important for all living beings (animals, human beings, plants and trees), comes from different sources and has many uses. There are different sources of water such as sea, well, river, lake, pond, rain. We use it daily for washing, bathing, drinking and in industries. Water helps in controlling the temperature of the atmosphere.**

### **Learning Outcomes:**

Children will be able to:

1. Describe that water dissolves many substances and it is a universal solvent;
2. Identify a solution, suspension and colloid on the basis of properties;
3. State the differences between saturated, unsaturated and supersaturated solutions;
4. Describe water of crystallization;
5. Write equations of metals with cold water and steam;
6. Describe hard and soft water;
7. Discuss the different methods of softening of water.

## **Theme 09: Carbon and its Compounds**

**In this theme children will learn the importance of carbon and some of its compounds. It is a constituent of all plants and animals. In fact, a large number of compounds are made up of carbon. It is a very versatile element.**

**Products such as paper, wooden furniture, soaps, food items are made up of carbon as one of their elements and used extensively in daily life activities. The fuel that is used in cars and trucks is also made of carbon.**

### **Learning Outcomes:**

Children will be able to:

1. Explain the term allotropy;
2. Describe different Allotropes of Carbon;
3. State the properties of Graphite and Diamond;
4. Prepare carbon dioxide in a laboratory;
5. Describe the uses of carbon dioxide;
6. Demonstrate different reactions of carbon dioxide with lime water and litmus solutions

Month		Chapter	Name of the chapter
-------	--	---------	---------------------

June	13-22	2	Physical & Chemical Changes
July	June 23----- July 8	1	Matter
July	18--- 29	3	Elements ,Compounds&mixtures
August	1----- 20	4	Atomic Structure
September	12---- 30	5	Language of chemistry
October	1--- 31	6	Chemical reactions
November	1----- 30	9	Carbon & its compounds Periodic Table
January	1--- 30	7	Hydrogen
February	1---15	8	.Water

#### Annual Marking Scheme

Exam	Mark	Topic	Mark Division
First mid-term	25	1. Matter 2. Physical & Chemical Changes	15 10

First Term	40	1. Matter 2. Physical quantities & Measurement 3. Elements ,Compounds & mixtures 4. Atomic Structure	10 10 10 10
Second mid term	25	5. Language of chemistry 6. Chemical reactions	15 10
Second term	80	5. Language of chemistry 6. Chemical reactions 9. Carbon & its compounds Periodic Table	20 20 20 20
Annual Exam	80	7. Hydrogen 8. Water 5. Language of chemistry 4. Atomic Structure	30 30 10 10