

From the session 2023-24, the textbooks are rationalised under the new National Education Policy 2020. This **Sanjiv Refresher** is completely based on the new rationalised textbooks.

Sanjiv Refresher

SCIENCE

CLASS IX

(Based on the Latest CBSE Syllabus & NCERT Textbook)

Main Features

- **Strictly designed as per the CBSE syllabus 2023-24 and the latest NCERT textbook edition.**
- **Objective Type Questions, Very Short Answer Type Questions, Assertion-Reasoning and Case-Study Based Questions as per the latest CBSE syllabus 2023-24.**
- Detailed Summary for Better Understanding.
- In-text Activities and Questions with Solutions.
- NCERT Textbook Exercises with Answers.
- Important Additional Questions under the Heading 'Let's Know More'.
- Solved NCERT Exemplar.
- Viva Voce Questions Based on Experiments.

Price
₹ 300.00

Publisher :
SANJIV PRAKASHAN
Jaipur

Published by :

SANJIV PRAKASHAN

Dhamani Market, Chaura Rasta,
Jaipur-302003

email : sanjeevprakashanjaipur@gmail.com

website : www.sanjivprakashan.com

© Publisher

Laser Typesetting :

Sanjiv Prakashan (DTP Department)

Jaipur

Every effort has been made to remove the mistakes and omissions in this book. In case of any suggestion or any error found, send an email or post a letter to us at the following address :

Email : sanjeevprakashanjaipur@gmail.com

Postal Address : Publication Department

Sanjiv Prakashan,

Dhamani Market, Chaura Rasta,

Jaipur-302003

Your suggestions shall be taken care of in our next edition.

Though all the precautions have been taken in publishing this book yet for any mistake the author, publisher or printer is not liable. All disputes are subjected to Jaipur Jurisdiction only.

© Rights are reserved. No part of this publication may be produced in any form, by photocopy, microfilm, xerography, recording or otherwise without the prior written permission of the publisher. Any breach will entail legal action and prosecution without further notice.

Contents

1. Matter in Our Surroundings	1 - 31
2. Is Matter Around Us Pure?	32 - 59
3. Atoms and Molecules	60 - 86
4. Structure of the Atom	87 - 126
5. The Fundamental Unit of Life	127 - 166
6. Tissues	167 - 206
7. Motion	207 - 254
8. Force and Laws of Motion	255 - 287
9. Gravitation	288 - 326
10. Work and Energy	327 - 370
11. Sound	371 - 403
12. Improvement in Food Resources	404 - 441
● Practicals	442 - 460



Matter in Our Surroundings

Basic Concepts

- Since early times, human beings have been trying to understand their nature. Earlier, matter was classified into five basic elements, the “*Pancha Tattva*”—Air, Earth, Fire, Sky and Water.
- **Matter** : Anything that occupies space and has mass is called matter. For example – Chair, table, cow, pencil, tree, etc.
- **Characteristics of Matter** :
 - ▶ Matter is made up of small particles. These small particles are called atoms.
 - ▶ These atoms are too small, so they cannot be seen by naked eye.
 - ▶ The atoms are constantly moving as they possess kinetic energy.
 - ▶ These particles have inter-spaces between them.
 - ▶ Particles of matter attract each other because of force of attraction.
- **Three states of Matter** :

There are three states of matter –

 - (1) **Solid** : Solids have fixed volume and shape. In solids, particles are closely packed and they have very less spacing between them. In solids, particles only vibrate at their mean position and they have less kinetic energy. The force of attraction between the particles of solids is very strong. For example – Stone, wood, sugar, coal, etc.
 - (2) **Liquid** : Liquid has fixed volume but indefinite shape. In liquid, there is a weaker force of attraction and more spacing between the particles. In liquids, particles can move around and have high kinetic energy. For example – Milk, water, petrol, kerosene, etc.
 - (3) **Gas** : Gases have indefinite shape and volume. Particles of gases have large space between them, but very weak attraction between them. Particles of gases move around very easily and have very high kinetic energy. For example – Air, hydrogen, nitrogen, etc.
- **Changes in states of Matter**
 - (i) Matter can be changed from one state to another state. A solid can be changed into liquid and a liquid can be changed into gas.
 - (ii) Most of the metals, which are solid turn into liquid on heating and turn into vapour on further heating.
 - (iii) The change in states of matter mainly depends upon two factors :
 - (a) Temperature
 - (b) Pressure

- **Temperature :** Generally, on heating temperature of substances increases. But, during the transformation, temperature remains the same.
 - ▶ **Melting point :** It is the temperature at which a solid changes into liquid.
 - ▶ **Boiling point :** It is the temperature at which a liquid changes into gas.
 - ▶ On heating—
 - (i) **Temperature increases :** When temperature increases, heat is used to increase the motion of the particles.
 - (ii) **State changes :** Particles use heat to overcome force of attraction to change the state.
 - ▶ **Latent heat :** It is the heat supplied to a substance during the change of its state.
 - (i) **Latent heat of fusion :** It is the amount of heat energy required to change 1 kg of solid into liquid at its melting point.
 - (ii) **Latent heat of vapourisation :** It is the amount of heat energy required to change 1 kg of a liquid to gas at atmospheric pressure at its boiling point.
- **Pressure :**
 - Solid :**
 - (i) There is no effect of pressure on solids.
 - (ii) Solids are non-compressible.
 - (iii) When pressure increases on solid, it is deformed and finally broken.
 - Liquid :**
 - (i) There is no effect of pressure on liquid.
 - (ii) Liquids are non-compressible.
 - Gas :**
 - (i) The volume of gas decreases with increase in pressure.
 - (ii) Since, there is lot of space between the particles of gas. Therefore, gas is compressible.
- **Evaporation :** Evaporation is a phenomenon in which a liquid changes into vapour below its boiling point.
- **Factors Affecting Evaporation :**
 - (i) Temperature
 - (ii) Surface area
 - (iii) Humidity
 - (iv) Wind
- **Cooling Effect of Evaporation :** Liquid needs latent heat of evaporation. It takes this heat from things in its surroundings. It means things in surroundings lose heat and thus they get cooled down.

INTEXT ACTIVITIES SOLUTION

Activity 1.1

For Activity and Figure : Refer NCERT Textbook

Q. 1. What do you think has happened to the salt?

Ans. Salt is dissolved in water.

Q. 2. Where does it disappear?

Ans. Particles of salt filled in the gaps between the particles of water.

Q. 3. Does the level of water change?

Ans. No, there is no change in level of water.

Activity 1.2

For Activity and Figure : Refer NCERT Textbook

Q. Is the water still coloured?

Ans. Yes, water is still coloured. With every dilution, though the colour becomes light, it is still visible. This happens because matter is made of very small particles, which are spread in the water.

Activity 1.3

• **Put an unlit incense stick in a corner of your class.**

Q. 1. How close do you have to go near it so as to get its smell?

Ans. One has to go very close to get the smell of the unlit incense stick.

Q. 2. Now, light the incense stick. What happens?

Ans. After lighting the incense stick, smoke starts coming out of it.

Q. 3. Do you get the smell sitting at a distance?

Ans. Yes, now we can get smell of incense stick sitting at a distance.

Conclusion : This shows that, matters consists of small particles which are moving continuously. This means that particles of matter possess kinetic energy. Smell of lighted incense stick diffuse, with air present around and reaches to us sitting at a distance.

Activity 1.4

For Activity : Refer NCERT Textbook

Q. 1. What do you observe immediately after adding the ink drop?

Ans. Ink started mixing with water immediately after adding, which is visible in the form of many thread-like structures.

Q. 2. What do you observe immediately after adding a drop of honey?

Ans. Honey slowly get directed towards bottom of water.

Q. 3. How many hours or days does it take for the colour of ink to spread evenly throughout the water?

Ans. It takes about one hour to spread colour of ink throughout the water.

Conclusion : This happens because ink has about equal or slightly higher density than that of water, so ink started immediately mixing with water, because particles of matter are moving continuously.

Density of honey is very high than that of water, so honey first starts to direct towards bottom.

Activity 1.5

• **Drop a crystal of copper sulphate or potassium permanganate into a glass of hot water and another containing cold water. Do not stir the solution. Allow the crystals to settle at the bottom.**

Q. 1. What do you observe just above the solid crystal in the glass?

Ans. A solid crystal starts mixing in the water in the form of thread-like structures. Coming of thread-like structures in cold water is slower than that of in the hot water.

Q. 2. What happens as time passes?

Ans. As time passes, crystal starts getting dissolved in water, both hot and cold. But it takes more time to dissolve crystals in cold water than in hot water.

Q. 3. What does this suggest about the particles of solid and liquid?

Ans. This suggests that matter is made up of tiny particles and these particles are in motion continuously.

Q. 4. Does the rate of mixing change with temperature? Why and how?

Ans. Rate of mixing increases with increase in temperature. This is because heat particles of matter gets more kinetic energy and they starts moving faster.

Activity 1.6

For Activity and Figure : Refer NCERT Textbook

Q. 1. Which group was the easiest to break? Why?

Ans. The third group of students was the easiest to break. This is because students are not holding hands or bounded with their finger tips. This means that there was no strong bonding force present in third group and could be broken easily.

Q. 2. If we consider each student as a particle of matter then in which group the particles held each other with the maximum force?

Ans. Particles held each other in first group with maximum force.

Activity 1.7

- Take an iron nail, a piece of chalk and a rubber band.
- Try breaking them by hammering, cutting or stretching.
- In which of the above three substances, do you think the particles are held together with greater force?

Ans. Iron nail did not break, thus the particles of iron are held together with greater force.

Activity 1.8

- Take some water in a container; try cutting the stream of water with your fingers.

Q. 1. Were you able to cut the stream of water?

Ans. No, we were not be able to cut the stream of water.

Q. 2. What could be the reason behind the stream of water remaining together?

Ans. The reason behind the stream of water remaining together is that particles of water are held together with force of attraction.

Activity 1.9

For Activity : Refer NCERT Textbook

Q. 1. Do all these have a definite shape, distinct boundaries and a fixed volume?

Ans. Yes, all these have a definite shape, distinct boundaries and a fixed volume.

Q. 2. What happens if they are hammered, pulled or dropped?