



Based on Rationalised NCERT Syllabus

As per
NCF 2023

Teacher's Manual

for

New Lakhmir Singh's

SCIENCE

Lakhmir Singh
Manjit Kaur

For Class

8



Download myStudygear
app and Scan this QR
to access e-Resources



Based on Rationalised NCERT Syllabus

As per
NCF 2023

Teacher's Manual

for

New Lakhmir Singh's

SCIENCE

Lakhmir Singh
Manjit Kaur

For Class

8





S CHAND SCHOOL BOOKS

(An imprint of S Chand Publishing)

A Division of S Chand And Company Limited

(An ISO 9001 Certified Company)



Head Office : D-92, Sector 2, Noida, Uttar Pradesh-201 301

Phone : 0120-468 2700, **e-mail :** info@schandpublishing.com

Registered Office : A-27, 2nd Floor, Mohan Co-operative Industrial Estate, New Delhi-110 044
www.schandpublishing.com; **e-mail :** helpdesk@schandpublishing.com

Marketing Offices :

Chennai	:	Ph: 044-2363 2120, chennai@schandpublishing.com
Guwahati	:	Ph: 0361-406 6369, guwahati@schandpublishing.com
Hyderabad	:	Ph: 040-4018 6018, hyderabad@schandpublishing.com
Jalandhar	:	Ph: 0181-464 5630, jalandhar@schandpublishing.com
Kolkata	:	Ph: 033-2335 7458, kolkata@schandpublishing.com
Lucknow	:	Ph: 0522-400 3633, lucknow@schandpublishing.com
Mumbai	:	Ph: 022-2500 0297, mumbai@schandpublishing.com
Patna	:	Ph: 0612-226 0011, patna@schandpublishing.com

© S Chand And Company Limited, 2017

All rights reserved. No part of this publication may be reproduced or copied in any material form (including photocopying or storing it in any medium in form of graphics, electronic or mechanical means and whether or not transient or incidental to some other use of this publication) without written permission of the publisher. Any breach of this will entail legal action and prosecution without further notice.

Jurisdiction : All disputes with respect to this publication shall be subject to the jurisdiction of the Courts, Tribunals and Forums of New Delhi, India Only.

First Published 2017

Revised Edition 2022, 2023, 2024

This Revised Edition 2025

Code : 10SE001827

Product Code : SCS2LKS086SCIAE25CBY

PRINTED IN INDIA

By Vikas Publishing House Private Limited, Plot 20/4, Site-IV, Industrial Area Sahibabad, Ghaziabad-201 010 and Published by S Chand And Company Limited, A-27, 2nd Floor, Mohan Co-operative Industrial Estate, New Delhi-110 044.

Preface

Taking into consideration the ever-growing advancements in the field of education; the concept of teaching goes beyond the conventional chalk and talk method. It evolves into the new-age learning where rote learning is replaced by the concept of activity-based learning and imparting knowledge. Illustrations and experimental pedagogy aid to imbibe the scientific concepts with a better understanding of the subject.

The Lakhmir Singh's Science series enhances the overall learning experience of a child. Learning science is made fun through numerous experiments, activities, projects, assignments and assessments. This not only proves to be engaging for the pupils but also helps the teachers to customize teaching and add an innovation to their classes.

In the new age of technology; these books bring to you a variety of performance-based assessments that will enable the learners to inculcate knowledge of concepts and provide an insight within. This will help the students to develop a scientific and rational attitude towards the concept and work upon the challenges with zeal and confidence. Holistic development of the students will be successfully achieved by:

- rational approach
- execution of learnt concepts
- developed inquisitiveness
- critical mindset
- research and study beyond the books

Lakhmir Singh's Science Teacher's Manual is tailor-made for the teachers who use the course book. The manual will serve as a medium to support the classroom lessons and renovate them with activities and tasks mentioned in it. It will serve as an effective tool to the teachers' classroom lessons.

Salient features

- Detailed lesson plan: This is a briefing of the entire chapter. It includes key points to be highlighted, suggested number of periods for each subtopic, aim of learning and supporting tasks.
- Warm-up activities: This focuses on some brainstorming activities that will help in initiating the chapter and create a suitable environment for learning.
- Vocabulary: It helps the students to learn new terminologies.
- Expected learning outcomes: Distinct introspection and the ability to comprehend the chapter should be enabled by the students at the end of the chapter.
- Projects, discussions and activities: This helps in continuous and comprehensive learning of the concepts by the students.
- Answers to the questions mentioned in the course book alongwith the Higher Order Thinking Skills (HOTS) answers.
- Worksheets after every chapter will help the teacher to conduct surprise test or assessments to realize the understanding level of the students.

NEP 2020

According to the NEP 2020, learning in schools should be holistic, integrated, enjoyable and engaging. The Foundational and Preparatory Stages focus on flexible, multilevel, play/activity-based learning. The Lakhmir Singh's Science series has been created with the purpose that learning should be fun. Competencies are the applied skills and knowledge that enable learners to successfully lead their life and perform the work required by them in daily life. They are a way to verify that a learner has in fact learned what has been intended. Learning Outcomes (LOs) are an integral part of Competency Based Education (CBE). LOs are general statements that tell us what a student can accomplish after having learnt a given topic/concept. Thus, LOs are an extremely important tool for students and teachers alike. The LOs mentioned in the beginning of each chapter in this Teacher's Book are completely mapped to the syllabus requirements. Teachers need to use these LOs as a tool for improving education and not as a means of simply completing a topic. The power verbs of LOs are also underlined in the detailed lesson plans to help the teachers to achieve this goal.

Some more NEP features with example pages

Relating Science to Our Daily Life

TOPIC	TEXTBOOK PAGES
Storage of food grains	25
Food from animals	26
Preservation of food	44
Coal	53
Natural gas	57
Petrochemicals	58
Fuels	71
Burning of fuels leads to harmful products	76
Recycling of paper	93
Reproductive health	132
Effects of force	145
Types of forces	147
Uses of magnetic force in everyday life	151
Explanation of everyday observations on the basis of pressure	154
Applications of atmospheric pressure in everyday life	163
Friction is a necessary evil	178
We hear through our ears	201
Audible and inaudible sounds	208
Noise and music	209
Musical instruments	210
Noise pollution	211
Electroplating	226
Lightning conductor	244
Formation of image by plane mirror	261
Visually challenged people can read and write	272

Life Skills

TOPIC	PAGES
Making of curd	35
Food poisoning by microorganisms	44
Conditions necessary for combustion	65
How to control fire	69
Structure of a flame	74
Deforestation-its causes and effects	83
Changes at puberty	122
Role of hormones other than sex hormones in the body	135
Role of hormones in completing the life history of frogs and insects	136
Non-contact forces	149
Pressure exerted by liquids	156
Pressure exerted by gases	160
Factors affecting friction	172
Static, sliding and rolling friction	175
Production of sound by vibration of vocal cords in human beings	196
Sound needs a medium for propagation	197
Characteristics of sound: loudness, pitch and quality	204
Electrolysis of Water	224
Purification of metals by chemical effects of electric current	229
Kaleidoscope	264
Dispersion of sunlight or white light by prism	265
Persistence of vision	269

Cross Curricular Links

TOPICS	PAGES
Irrigation (Geography)	18
Coal- Its formation and uses (Geography)	53
Petroleum (Geography)	55
Natural gas (Geography)	57
The history of matchstick (History)	68
Conservation of forests and Wildlife (Geography)	85
Lightning (Geography)	242
Earthquakes (Geography)	245

Experiential Learning

FEATURED ACTIVITIES	SKILLS	PAGES
Selecting healthy from a collection of seeds	Curiosity based	13
Showing the effect of manure and fertiliser on the growth of plants	Activity/ observation-based	17
Showing the presence of micro-organisms in soil and water	Activity/ observation-based	34
Fermenting sugar solution by yeast	Activity/ observation-based	36
Showing that micro-organisms convert plant waste materials into manure	Activity/ research based	38
Showing that air is necessary for combustion	Activity/ observation based	65
Showing that it is essential for a substance to reach its ignition temperature before it starts burning	Activity/ research based	68
Showing that innermost zone of a candle flame consists of unburnt wax vapours	Activity/ observation based	75
Showing that middle zone of a candle flame consists of unburnt carbon particles	Activity/ observation based	76
Showing that outermost zone of a candle flame is the hottest	Activity/ observation based	76
Showing that unlike magnetic poles attract while like poles repel each other	Activity/ observation based	150
Attracting tiny pieces of paper by a plastic comb rubbed in dry hair	Curiosity/ discovery based	151
Showing that pressure of a liquid increases with depth	Activity/ observation based	157
Demonstrating that liquids exert pressure on the bottom of the container in which they are kept	Activity/ Observation	157
Demonstrating that a liquid exerts pressure on the walls of its container	Activity/ research based	158
Demonstrating that a liquid exerts equal pressure at the same depth	Activity/ research based	159

FEATURED ACTIVITIES	SKILLS	PAGES
Showing the existence of atmospheric pressure	Curiosity based	161
Showing that friction acts in opposite direction to the motion of a body	Curiosity/ observation based	171
Showing that force of friction depends on the nature of two surfaces in contact	Curiosity/ observation based	173
Showing that friction is more between the rough surfaces in contact than in between smooth surfaces	Activity/ research based	174
Showing that force of friction increases when the surfaces in contact are pressed harder	Activity/ Observation	174
Showing that there is static friction between a wooden block and a table top in contact with each other	Curiosity based	175
Showing that sliding friction is smaller than static friction	Activity/ Observation	176
Showing that rolling friction is smaller than sliding friction	Activity/ Observation	177
Demonstrating how vocal cords produces sound	Curiosity based	196
Demonstrating how sound travels through solids	Curiosity based	197
Demonstrating that sound cannot travel through vacuum	Observation	199
Demonstrate the working of eardrum	Curiosity based	202
Demonstrating dependence of loudness of sound on amplitude of the vibrations of sound producing object	Activity/ Observation	205
Determining the relation between frequency and pitch of sound producing object through a vibrating ruler	Curiosity/ observation based	207
Testing the liquids for conduction of electricity	Activity/ discovery based	220
Demonstrating the chemical effect of current	Activity/ discovery based	224

FEATURED ACTIVITIES	SKILLS	PAGES
Demonstrating the change in colour caused by chemical effect of electric current	Curiosity/ discovery based	225
Demonstrate the electroplating of copper on iron	Activity/ research based	227
Purifying the impure copper metal through chemical effect of electric current	Activity/ Observation	229
Showing the existence of electric charges	Curiosity based	236
Demonstrating that two balloons, each carrying negative charges repel each other	Activity/ curiosity based	238
Demonstrating that two used ball pens, each carrying positive charges repel each other	Activity/ curiosity based	239
Demonstrating that two bodies carrying unlike charges attract each other	Activity/ curiosity based	239
Constructing a simple electroscope	Curiosity based	240
Detecting electric charge through an electroscope	Activity/ research based	242
Studying reflection of light from a plane mirror	Activity/ Observation	256
Demonstrating that white light splits into its constituent colours on passing through a glass prism	Activity/ discovery based	266
Demonstrating the existence of blind spot in eyes	Activity/ curiosity based	268
Demonstrating persistence of vision	Activity/ curiosity based	269

Teacher's Book Chapter Walkthrough

1 Crop Production and Management

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Define crops and classify them into 2 main groups- kharif and rabi crops
- Explain basic agricultural practices and list the tools and implements used in agriculture
- Differentiate between manure and fertilizers
- Recognize the traditional and modern methods of irrigation
- List the food items obtained from animals

Textbook: Refer to pages 9 to 30

Periods allocated: 15 periods

VOCABULARY

Crop, Kharif crop, Rabi crop, agriculture, ploughing, levelling, manuring, plough, hoe, cultivator, sowing, broadcasting, seed drill, transplantation, manure, fertilizer, crop rotation, irrigation, moat, chain pump, Dheki, Rahat, sprinkler system, drip system, weeds, weeding, harvesting, threshing, winnowing, combine, animal husbandry.

ACTIVITIES FOR PERIOD 1

Crop and its types (Page 9)

Learning Tools

Interactive warm up exercise: Discussing with the students the importance of photosynthesis in plants to synthesise food would be a good start for the topic. Ask students the names of inorganic substances required by plants for the formation of organic food nutrients.

Chapter opening exercise: Students should be asked how man obtains his food from plants as well as animals.

Expected Learning Outcomes: Mapped to the NCERT LOs, suggested number of periods required to achieve the LOs is also mentioned

Vocabulary: Important words of the chapters

Activities: Teaching ideas given period-wise to help in planning the class

Learning Tools: Includes interactive warm-up ideas to initiate the interest, chapter-opening exercises for the first period

Teacher-guided discussions: To facilitate group discussions, interactivity, setting up LO goals, check previous knowledge, collaborative ideas in the classroom

Integration: The NEP 2020 guidelines integrated in the lesson plan

Suggested home assignments: Readymade homework for students, teachers can make changes in them to suit their requirement

● Teacher guided discussion
Discuss with them that when the same kind of plants are grown in the fields on a large scale to obtain foods like cereals, pulses, vegetables and fruits, etc. it is called a crop. Students should be able to cite examples of different crops. Explain that there are two types of crops: Kharif crops which are sown in the rainy season and Rabi crops which are grown in the winter season.

Suggested home assignment

Give three examples each of Kharif crops and Rabi crops.

NEP Local Knowledge: The teacher can ask the students to observe food grains at their home and classify them into different kinds.

ACTIVITIES FOR PERIOD 2

Preparation of soil for crop production and Agricultural Implements (Page 11)

Teacher guided discussion

Discuss with them that preparation of soil is the first step in cultivating a crop for food production. The loosening and turning of soil is called ploughing or tilling. Students should know that ploughing is done using a plough. Students should be familiarized with the reasons why ploughing is beneficial. Explain that the ploughed soil is leveled by pressing it with a wooden lever so that the top soil is not blown away by wind or drained off by water. Students should be familiarized with the reasons why ploughing is considered beneficial. Discuss that manuring is adding manure to the soil to increase the fertility of the soil. Students should know that the main agricultural implements used for loosening and turning the soil are plough, hoe and cultivator.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Name the main agricultural implements used for loosening and turning the soil. Paste their pictures in your copy.

ACTIVITIES FOR PERIOD 3

Sowing (Page 13)

Teacher guided discussion

Explain them that the process of scattering seeds in the soil for growing the crop plants is called sowing. Students should know the difference between healthy seeds and spoiled seeds. Discuss that seeds can be sown either by hand and this method is called broadcasting or by using a seed drill. Students should know that sowing by seed drill is better than sowing by hand. Students should be made aware of the precaution to be taken while sowing seeds and the advantages of sowing with a seed drill. Explain that transplantation is the process of transferring the seedlings from the nursery to the main field by hand. Advantages of transplantation should be discussed. Students should be able to give examples of plants which are cultivated by the method of transplantation.

ACTIVITIES FOR PERIOD 10

Revise all the topics covered in the previous lessons

Using resources

Using resources
Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 11 AND 12

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 13 AND 14

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

- 1. Name the following:**

 - (a) Coke
 - (b) Coal tar
 - (c) Coal tar
 - (d) Bitumen
 - (e) Kerosene
 - (f) Liquefied Petroleum Gas
 - (g) Methane
 - (h) Natural gas
 - (i) Bihar, West Bengal
 - (j) Petroleum Conservation Research Association

2. Fill in the following blanks with suitable words:-

 - (a) carbon
 - (b) carbonisation
 - (c) refining
 - (d) CNG
 - (e) pollution; warming

3. State whether the following statements are true or false :-

 - (a) True
 - (b) True
 - (c) False
 - (d) False
 - (e) False

Subjective Type Questions

Short Answer Type Questions

1. Fossil fuels are exhaustible natural resources because once all the fossil fuels are used up, they will be gone forever.
 2. About 300 million years ago, the earth had dense forests in low-lying wet land areas. Due to natural processes like earthquakes, volcanoes and floods, etc., these forests were buried under the surface of earth. As more soil deposited over them, they were compressed. The temperature also rose as they sank deeper and deeper. Due to high pressure and high temperatures, the organic matter and inorganic air, soil, wood of buried forest plants and trees was slowly converted into oil. This process by which the dead plants buried deep under the earth have become coal is called carbonisation.
 3. When heated in air, coal burns and produces mainly carbon dioxide gas. A lot of heat energy is also released during the burning of coal.

37

Worksheets: Additional questions for more practice

WORKSHEET- CLASS 8, CHAP. 5 CONSERVATION OF PLANTS AND ANIMALS

Name: Class: Date:

A. Objective Type Questions

- Identify the endangered species of animals:
 - Asiatic lion
 - Irish deer
 - The indiscriminate killing of which animal can lead to the loss in production of food grains:
 - Rats
 - Snakes
 - One of the following is not a consequence of deforestation:
 - Increase in soil erosion
 - Decrease in rainfall
 - A wild animal which is the friend of the farmer:
 - Deer
 - Snakes
 - Why are snakes killed in large numbers?
 - They are poisonous.
 - They kill rats.
 - An activity, not checked in time, may lead to rise in sea level causing the flooding of low-lying coastal areas:
 - Desalination
 - Deforestation

Remarks

Teacher's signature

M.M. 50

A. Objective Type Questions

- Objective Type Questions**

1. Fill in the blanks:

 - refers to the variety of plants, animals and micro-organisms found in an area.
 - The species which are on the verge of vanishing from the earth are
 - Satpura National Park is a part of Biosphere Reserve.
 - Paper can be recycled to times.
 - The species that have died out completely from the surface of earth are species.

Sample Paper: Can be used for continuous assessments

(e) Two biosphere reserves.

B. Short Answer Type Questions

- Differentiate between wildlife sanctuary and zoo.
- What is desertification? Which human activities lead to desertification?
- What is global warming? Which gas is responsible for it?
- Define the following terms:
 - Biodiversity
 - Ecosystem
 - Wildlife sanctuary
 - Endemic species
- National park
- Biosphere reserve
- Differentiate between:
 - Wildlife sanctuary and National park
 - Endangered species and extinct species
- What is "Project Tiger"? What are the objectives of this project?
- What are the aims of Forest Conservation Act in India?
- Why does Siberian crane come from Siberia to places like Bharatpur in India every year for few months?

63

Contents

Chapter 1: Crop Production and Management	13
Chapter 2: Micro-Organisms: Friend and Foe	24
Chapter 3: Coal and Petroleum	34
Chapter 4: Combustion and Flame	43
Chapter 5: Conservation of Plants and Animals	53
Chapter 6: Reproduction in Animals	64
Chapter 7: Reaching the Age of Adolescence	74
Chapter 8: Force and Pressure	85
Chapter 9: Friction	95
Chapter 10: Sound	105
Chapter 11: Chemical Effects of Electric Current	116
Chapter 12: Some Natural Phenomena	125
Chapter 13: Light	134
Answers to Worksheets and Sample Papers for Chapters 1 to 13	144 - 164

1

Crop Production and Management

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Define crops and classify them into 2 main groups- kharif and rabi crops
- Explain basic agricultural practices and list the tools and implements used in agriculture
- Differentiate between manure and fertilizers
- Recognize the traditional and modern methods of irrigation
- List the food items obtained from animals

Textbook: Refer to pages 9 to 30

Periods allocated: 15 periods

VOCABULARY

Crop, Kharif crop, Rabi crop, agriculture, ploughing, leveling, manuring, plough, hoe, cultivator, sowing, broadcasting, seed drill, transplantation, manure, fertilizer, crop rotation, irrigation, moat, chain pump, Dhekli, Rahat, sprinkler system, drip system, weeds, weeding, harvesting, threshing, winnowing, combine, animal husbandry.

ACTIVITIES FOR PERIOD 1

Crop and its types (Page 9)

Learning Tools

Interactive warm up exercise: Discussing with the students the importance of photosynthesis in plants to synthesise food would be a good start for the topic. Ask students the names of inorganic substances required by plants for the formation of organic food nutrients.

Chapter opening exercise: Students should be asked how man obtains his food from plants as well as animals.

Teacher guided discussion

Discuss with them that when the same kind of plants are grown in the fields on a large scale to obtain foods like cereals, pulses, vegetables and fruits, etc. it is called a crop. Students should be able to cite examples of different crops. Explain that there are two types of crops: Kharif crops which are sown in the rainy season and Rabi crops which are grown in the winter season.

Suggested home assignment

Give three examples each of Kharif crops and Rabi crops.

NEP

Local Knowledge: The teacher can ask the students to observe food grains at their home and classify them into different kinds.

ACTIVITIES FOR PERIOD 2

Preparation of soil for crop production and Agricultural Implements (Page 11)

Teacher guided discussion

Discuss with them that preparation of soil is the first step in cultivating a crop for food production. The loosening and turning of soil is called ploughing or tilling. Students should know that ploughing is done using a plough. Students should be familiarized with the reasons why ploughing is beneficial. Explain that the ploughed soil is leveled by pressing it with a wooden leveller so that the top soil is not blown away by wind or drained off by water. Students should be familiarized with the reasons why ploughing is considered beneficial. Discuss that manuring is adding manure to the soil to increase the fertility of the soil. Students should know that the main agricultural implements used for loosening and turning the soil are plough, hoe and cultivator.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Name the main agricultural implements used for loosening and turning the soil. Paste their pictures in your copy.

ACTIVITIES FOR PERIOD 3

Sowing (Page 13)

Teacher guided discussion

Explain them that the process of scattering seeds in the soil for growing the crop plants is called sowing. Students should know the difference between healthy seeds and spoiled seeds. Discuss that seeds can be sown either by hand and this method is called broadcasting or by using a seed drill. Students should know that sowing by seed drill is better than sowing by hand. Students should be made aware of the precaution to be taken while sowing seeds and the advantages of sowing with a seed drill. Explain that transplantation is the process of transferring the seedlings from the nursery to the main field by hand. Advantages of transplantation should be discussed. Students should be able to give examples of plants which are cultivated by the method of transplantation.

Using resources

- Conduct the activity given on Page no. 13 of the book to select healthy seeds and differentiate them from spoiled seeds.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Give examples of plants cultivated by the method of transplantation.

NEP

21st Century skills: The teacher can show a relevant video to the students depicting visit of a group of students to a plant-nursery and based on the video questions can be asked on how seeds & small plants are cared before trans-planting to the main field.

ACTIVITIES FOR PERIODS 4 AND 5

Adding manure and fertilizers (Page 15)

Teacher guided discussion

Discuss that the deficiency of plant nutrients and organic matter in the soil is made up by adding manures and fertilizers to the soil. Explain that manure is a natural substance obtained by the decomposition of animal wastes like cow dung, human wastes and plant residues which supplies essential elements and humus to the soil and makes it more fertile. Discuss that a chemical fertilizer is a salt or an organic compound containing necessary plant nutrients like nitrogen, phosphorus or potassium to make the soil fertile. Explain why excessive use of fertilizers is harmful. Students should be able to list the advantages of manure. Discuss the practice of crop rotation and its advantages.

Suggested home assignment

What is NPK? Why is it beneficial for the plant?

ACTIVITIES FOR PERIOD 6

Importance of irrigation and the factors affecting it (Page 18)

Teacher guided discussion

Explain to the students that the process of supplying water to crop plants in the fields is called irrigation. Discuss why irrigation is necessary and the factors affecting irrigation requirements of crops.

Suggested home assignment

Why is irrigation necessary?

ACTIVITIES FOR PERIOD 7

Traditional methods of irrigation (Page 20)

Teacher guided discussion

Discuss the various traditional methods of irrigation like Moat, Chain pump, Dhekli and Rahat (lever system). Discuss the use of pumps to lift water from wells, ponds, lakes, streams and rivers for irrigation.

Suggested home assignment

List the various traditional methods of irrigation. Write 2-3 lines about each method.

ACTIVITIES FOR PERIOD 8

Modern methods of irrigation (Page 22)

Teacher guided discussion

Explain them that the modern methods of irrigation use water economically. Discuss the sprinkler system and drip system in detail. Students should be able to list their advantages.

Suggested home assignment

Differentiate between moat and drip system of irrigation.

ACTIVITIES FOR PERIOD 9

Removing the weeds (Page 23)

Teacher guided discussion

Explain them that the unwanted plants which grow along with a cultivated crop are called weeds. Students should be able to name the different weeds found in wheat and rice fields. Discuss that the process of removing weeds from a crop field is called weeding. Students should be aware of the different methods of weeding and should be able to name the common weedicides.

Suggested home assignment

What is weedicide? Name three common weedicides.

ACTIVITIES FOR PERIOD 10

Harvesting (Page 24)

Teacher guided discussion

Explain that the cutting and gathering of the matured food crop is called harvesting which is followed by beating out the grains from the harvested crop plants by a process called threshing. Discuss that the process of separating grain from chaff and hay with the help of wind is called winnowing.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Differentiate between threshing and winnowing.

NEP

Art Integration: The teacher can ask the students to collect and paste pictures depicting different harvest festivals celebrated in India in their scrapbook with 2-3 lines written for each.

ACTIVITIES FOR PERIOD 11

Storage of food grains (Page 25)

Teacher guided discussion

Explain to the students that the food grains obtained by harvesting the crops are dried in the sunshine before storing, to reduce the moisture because higher moisture content promotes the growth of fungus and moulds on the stored grains which damages them.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

List the ways by which large scale storage of food grains is done.

ACTIVITIES FOR PERIOD 12

Food from animals (Page 26)

Teacher guided discussion

Explain to the students that animals also provide us food. The animals which provide us food are of two types: milk yielding animals, and meat and egg yielding animals. Tell them that the branch of agriculture which deals with the feeding, shelter, health and breeding of domestic animals is called animal husbandry. Students should be aware of the basic practices necessary for raising animals for food and other purposes.

Suggested home assignment

Name the various milk-yielding and meat and egg-yielding animals.

ACTIVITIES FOR PERIOD 13

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 14

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 15

Assessment of understanding of the chapter could be done with the help of the worksheet given for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following:-

- | | | |
|--------------------------------------|---------------|-----------------|
| (a) Sickle | (b) Threshing | (c) Winnowing |
| (d) Milk, meat, eggs | (e) Honey | (f) Proteins |
| (g) Leguminous crops | (h) Rhizobium | (i) Rice; Wheat |
| (j) Sprinkler system and drip system | | |

2. Fill in the blanks:

- | | | |
|-----------|-----------------|----------------------|
| (a) Crop | (b) Preparation | (c) nutrients; water |
| (d) float | (e) nitrogen | (f) irrigation |
| (g) weeds | (h) neem | (i) coastal |

3. Match items in column A with those in column B:

Subjective Type Questions

Short Answer Type Questions

6. The seeds should neither be placed too close nor too far apart. This is because if the seeds are sown too close, then plants formed from them will also be too close, and will not get enough sunlight, water, and other nutrients. Thus, an appropriate distance between the seeds is important to avoid overcrowding of plants. This allows the plants to get sufficient sunlight, nutrients and water from the soil. On the other hand, if the seeds are sown too far apart, then it will be wastage of field space.
7. The process of loosening and turning the soil is called ploughing (or tilling). Two implements used to plough fields are plough and cultivator.
8. The poisonous chemicals which are used to kill weeds (unwanted plants) in the fields are called weedicides. Some of the common weedicides are: 2,4-D, MCPA and Butachlor. Since weedicides are poisonous chemicals, therefore, spraying of weedicides may affect the health of the person who handles the weedicide sprayer. The weedicides should be sprayed on the standing crops very carefully. During the spraying of weedicides, the person should cover his nose and mouth properly with a piece of cloth (so as to prevent the inhaling of poisonous weedicide).
9.
 - (i) A manure is a natural substance obtained by the decomposition of animal wastes like cow dung, human waste, and plant residues. A fertiliser is a salt or an organic compound.
 - (ii) A manure is not very rich in essential plant nutrients like nitrogen, phosphorus and potassium. Fertilisers are very rich in plant nutrients like phosphorus and potassium.
 - (iii) A manure provides a lot of organic matter like humus to the soil. A fertiliser does not provide any humus to the soil.
 - (iv) A manure is absorbed slowly by the plants because it is not much soluble in water. Being soluble in water, a fertiliser is readily absorbed by the plants.
10. Harvesting- The cutting and gathering of the matured food crop is called harvesting.
Threshing- The process of beating out the grains from the harvested crop plants is called threshing.
Winnowing- The process of separating grain from chaff and hay with the help of wind is called winnowing.
11. A combine is a huge machine which cuts the standing cereal crop (like wheat) in the fields, threshes it and separates the chaff from grain in one operation. This grain is clean and can be directly filled in gunny bags and there is no need of winnowing.
12. The branch of agriculture which deals with the feeding, shelter, health and breeding of domestic animals is called animal husbandry.

Long Answer Type Questions

1. (a) The crops which are sown in the rainy season are called kharif crops. The rainy season in India is generally from June to September. The sowing for kharif crops starts in June–July at the beginning of southwest monsoon because these crops (particularly paddy) need substantial amount of water. The kharif crops are harvested at the end of monsoon season during September (or October). Two examples of kharif crops are : Groundnut and Cotton. The kharif crops are sometimes also called ‘summer crops’.

- (b) The crops grown in the winter season are called rabi crops. The time period of rabi crops is generally from October to March. The sowing for rabi crops begins at the beginning of winter (October–November) and the crops are harvested by March (or April). Some of the examples of rabi crops are: Mustard, and Linseed.
2. (a) The process of scattering seeds (or putting seeds) in the ground soil for growing the crop plants is called sowing. Sowing is the most important part of crop production. Before sowing, good quality seeds are selected. Seeds are sown in the soil either by hand or by seed drill. Thus, there are two methods of sowing the seeds in the soil. These are:
- (i) Sowing by hand, and (ii) Sowing with a seed drill.
- (b) Wheat is a rabi season crop. If wheat is sown in the kharif season, it will not grow well. This is because wheat plants cannot tolerate too much water of the rainy season.
3. Before sowing, good quality seeds are selected. Good quality seeds are clean and healthy seeds free from infection and diseases. Farmers prefer to use seeds which give high yield of food grains. We can select good, healthy wheat seeds from the given sample for sowing by the following way: Put all the seeds in a bucket containing water and stir well. Most of the seeds will settle down at the bottom whereas some seeds will float on top. The seeds which sink at the bottom of the bucket are the healthy seeds. On the other hand, the seeds which float on water are the spoiled seeds. This can be explained as follows: Healthy seeds are heavy, so they sink in water. The seeds which have been partially eaten by pests or damaged by disease become hollow and light, and hence float on water. The seeds may also be treated with fungicide solutions before sowing to prevent the seed-borne diseases of crops.
4. (a) The process of transferring the seedlings from the nursery to the main field by hand is called transplantation or transplanting. In this process, the seeds are first sown in a small plot of land or nursery and allowed to grow into **tiny plants called seedlings** by providing them with a good dose of nutrients. After the seeds have grown into tiny plants called seedlings in the seed-bed or nursery, only the healthy and well developed seedlings are then picked out from the nursery bed and transferred or transplanted to the regular field. Examples of crops which are usually grown by this process are: paddy (rice) and vegetables like tomatoes and chillies.
- (b) The various **advantages of the transplantation** process are given below :
- (i) The process of transplantation enables us to select only the better and healthy seedlings for the cultivation of crops. The bad seedlings can be rejected. This selection is, however, not possible when the seeds are directly sown in the soil.
- (ii) The process of transplantation allows better penetration (deeper penetration) of the roots in the soil.
5. (a) **The process of supplying water to crop plants in the fields is called irrigation.** Irrigation is necessary because:
- (i) Irrigation before ploughing the fields makes the soil soft due to which the ploughing of fields becomes easier.
- (ii) Irrigation is necessary to provide moisture for the germination of seeds. This is because seeds do not grow in dry soil.

- (iii) Irrigation is necessary to maintain the moisture of soil for healthy crop growth so as to get good yield.
 - (iv) Irrigation is necessary for the absorption of nutrient elements by the plants from the soil. The irrigation water dissolves the nutrients present in the soil to form a solution. This solution of nutrients is then absorbed by the roots for the development of plants.
 - (v) Water supplied to the crops during irrigation protects the crop plants from hot air currents as well as frost.
- (b) Crops are supplied water for irrigation from different sources like: **Rivers, Canals, Wells, Tube-wells, Dams (Reservoirs), Ponds and Lakes**. Even **rain** is a source of irrigation of crops. The water available in wells, lakes and canals is lifted up by different methods in different regions for taking it to the fields.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. (d) | 2. (c) | 3. (b) | 4. (d) | 5. (c) |
| 6. (d) | 7. (c) | 8. (b) | 9. (b) | 10. (d) |

Case Based Questions

1. Rice- kharif crop; Wheat-rabi crop
2. Kharif crop-Maize; Rabi-Gram (Students can give their own answers also.)
3. The crops will not grow well because if rice is grown in winter season, it will not get sufficient water. Similarly, if wheat is grown in the rainy season, it will not be able to survive because it cannot tolerate too much water.
4. Ploughing can be done using a tractor or with the help of animals like bullocks.

Assertion-Reason Based Questions

1. (a) Assertion and reason both are correct and reason is the correct explanation for assertion.
2. (b) Assertion and reason both are correct and but reason is not the correct explanation for assertion.
3. (d) Spoiled seeds are partially eaten by pests or damaged by diseases. So, seeds become hollow and float on water.
4. (d) Assertion is incorrect but reason is correct.



21st Century Skills

1. Ploughing the field ; Preparation of soil, Sowing; Manuring ; Irrigation ; Harvesting ; Sending crop to sugar factory.
2. (a) Crop rotation (b) The Rhizobium bacteria present in the root nodules of legumes fix the nitrogen gas of the atmosphere to form nitrogen compounds. Some of these nitrogen compounds go into the soil and replenish it.
3. Harvesting

WORKSHEET– CLASS 8, CHAP. 1 CROP PRODUCTION AND MANAGEMENT

Name: Class: Date:

A. Objective Type Questions

1. Which of the following crops would enrich the soil with nitrogen?

- | | |
|-----------|------------|
| (a) Apple | (b) Pea |
| (c) Paddy | (d) Potato |

2. Which of the following is not a Kharif crop?

- | | |
|-----------|---------------|
| (a) Paddy | (b) Mustard |
| (c) Maize | (d) Groundnut |

3. In agriculture, broadcasting is used for:

- | | |
|--------------------------|------------------------|
| (a) Ploughing the fields | (b) Rotating the crops |
| (c) Removing the weeds | (d) Sowing the seeds |

4. Tomatoes are cultivated by the practice called:

- | | |
|--------------------|---------------------|
| (a) Transpiration | (b) Translocation |
| (c) Transportation | (d) Transplantation |

5. The Rhizobium bacteria present in the root nodules of pea plants can fix one of the following from the atmosphere. The answer is:

- | | |
|--------------|-------------------|
| (a) Hydrogen | (b) Oxygen |
| (c) Nitrogen | (d) None of These |

6. Poultry gives us:

- | | |
|--------------------------|-----------|
| (a) Eggs | (b) Meat |
| (c) Meat as well as eggs | (d) Honey |

7. The best technique of watering the fruit plants and trees is:

- | | |
|--------------------------|----------------------|
| (a) Chain pump system | (b) Sprinkler system |
| (c) Moat (pulley system) | (d) Drip system |

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) An example of common weedicide is
- (b) Nitrogen deficiency of soil can be removed by
- (c) The process of separating grains from husk is called..... .
- (d) An example of Kharif crop is
- (e) The unwanted plants present in a crop field are

2. Name the following:

- (a) The practice in which different types of crops are grown alternately in the same field.
- (b) Major food nutrient provided by fish.
- (c) A meat yielding animal.
- (d) An implement used in sowing.
- (e) The agricultural practice carried out with the help of sickle.

B. Short Answer Type Questions

1. (a) Why is it necessary to dry the harvested food grains before storage?
(b) What are the two ways in which farmers store food grains?
2. Out of drip system and sprinkler system of irrigation, which one is more suitable:
 - (a) For uneven land-
 - (b) For sandy soil-
 - (c) For watering fruit plants-
 - (d) Where availability of water is poor-
3. (a) What are weeds? Name any one weed found in a crop field.
(b) Explain how do weeds affect the growth of crops?
4. Explain how, the irrigation requirements of a crop depend on the nature of soil in which the crop is grown.
5. Describe the sprinkler system of irrigation. State its advantages.
6. Explain the drip system of irrigation. State two advantages of the drip system of irrigation.
7. If wheat is sown in the Kharif season, what would happen? Discuss.
8. Which of the following are Kharif crops and which are Rabi crops: Wheat, Paddy, Gram, Maize, Mustard, Cotton, Soyabean, Linseed, Peas, Groundnut.
9. What is ploughing (or tilling)? Name any two implements used for tilling the fields.
10. Define manure. What are the advantages of manure?

2

Micro-Organisms: Friend and Foe

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Classify micro-organisms and explain each group of micro-organisms
- Explain how micro-organisms are useful to us
- Identify disease causing micro-organisms and list the diseases caused by them
- Recognize the carriers of disease causing micro-organisms
- Outline the ways for preventing diseases caused by micro-organisms
- List different methods of food preservation
- Identify how nitrogen fixation takes place in plants and illustrate nitrogen cycle

Textbook: Refer to pages 31 to 51

Periods allocated: 15 periods

VOCABULARY

Micro-organisms, fermentation, antibiotic, vaccine, vaccination, pathogen, communicable diseases, carrier, food poisoning, preservation, pasteurisation, nitrogen fixation, nitrogen cycle.

ACTIVITIES FOR PERIOD 1

Major groups of micro-organisms (Page 32)

Learning Tools

Interactive warm up exercise: Discussing the common diseases caused by bacteria or virus would be a good start for the topic. Discuss about common cold and viral fever.

Chapter opening exercise: Ask the students how formation of curd and bread takes place; which organisms help in their formation.

Teacher guided discussion

Discuss that those organisms which are too small to be seen without a microscope are called micro-organisms. Students should be familiarized with the classification of micro-organisms into five groups:- bacteria, viruses, protozoa, and some fungi and algae. Students should know their structure, examples and diseases caused by them. They should know the favourable conditions for micro-organisms to grow and live.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Mention the diseases caused by bacteria and viruses.

ACTIVITIES FOR PERIOD 2 AND 3

Friendly micro-organisms (Page 34)

Teacher guided discussion

Discuss the beneficial effects of micro-organisms in detail with the students. Making of curd and bread, commercial use of yeast to make alcohol by the process of fermentation, formation of acetic acid, antibiotics and vaccines should be discussed. Students should also know about the biological nitrogen fixers which increase soil fertility and micro-organisms which decompose decaying matter and thus clean the environment.

Suggested home assignment

Name the two biological nitrogen fixers in plants.

NEP

Experiential learning through outdoor activity: The teacher can ask the students to collect data from a nearby bakery when they visit there and make a tabular report on how & what kind of microbes are used in food processing there.

ACTIVITIES FOR PERIOD 4 AND 5

Disease causing micro-organisms in humans, animals and plants (Page 39)

Teacher guided discussion

Explain that micro-organisms which cause diseases are called pathogens. Students should know that microbial diseases which can spread from an infected person to a healthy person through air, water, food or physical contact, etc. are called communicable diseases. Students should be able to cite examples of communicable diseases. They should be aware of the methods for preventing the occurrence and spreading of communicable diseases. Discuss in detail the role of housefly and mosquitoes as carriers of diseases and the ways by which we can prevent these diseases. Give examples of diseases which are caused in animals and plants by micro-organisms.

Suggested home assignment

How can we prevent diseases spread by housefly and mosquitoes?

NEP

Life Skills (Communication): The teacher can engage the class in a discussion on Covid-19 vaccination which helps in protecting us against the adverse effects of this disease and also helps in scaling down the mortality rate.

ACTIVITIES FOR PERIOD 6

Food poisoning (Page 44)

Teacher guided discussion

Explain that the disease caused due to the presence of a large number of micro-organisms in the food, or due to the presence of toxic substances in food formed by the action of micro-organisms is called food poisoning. Discuss the names of micro-organisms causing food poisoning and its main symptoms.

Suggested home assignment

List the major symptoms of food poisoning.

ACTIVITIES FOR PERIOD 7

Preservation of food (Page 44)

Teacher guided discussion

Explain them that the process in which the food materials are given suitable physical or chemical treatment to prevent their spoilage is called food preservation. Discuss the various methods of food preservation like dehydration, heating, refrigeration, deep freezing. Usage of substances like common salt, sugar, mustard oil and vinegar, usage of special chemicals as preservatives, pasteurisation and sealing food material in air tight packets, should be discussed in detail with students.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

What is pasteurisation and how is it done?

NEP

Local Knowledge: The teacher can ask the students to enquire from elders & observe the jars of different food items at their home like pickles, jams, jellies, squashes, etc. to find out about the substances used for their preservation.

ACTIVITIES FOR PERIOD 8

Nitrogen fixation (Page 46)

Teacher guided discussion

Explain that the process of converting nitrogen gas of atmosphere into compounds of nitrogen which can be used by the plants is called nitrogen fixation. Discuss the role of *Rhizobium* bacteria present

in the root nodules of leguminous plants, the role of blue green algae and the role of lightning in carrying out the process of nitrogen fixation.

Suggested home assignment

Explain how *Rhizobium* bacteria, blue green algae and lightning fix nitrogen for the plants.

ACTIVITIES FOR PERIOD 9 AND 10

The nitrogen cycle (Page 47)

Teacher guided discussion

Discuss with the students that the circulation of nitrogen element through living things and non-living environment is called nitrogen cycle. Discuss the main steps in nitrogen cycle in nature.

Using resources

Use a chart showing the nitrogen cycle in nature to explain its main steps.

Suggested home assignment

Draw the nitrogen cycle in nature (Fig.20)

ACTIVITIES FOR PERIOD 11

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given with the book.

ACTIVITIES FOR PERIOD 12 AND 13

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 14 AND 15

Assessment of understanding of the chapter could be done with the help of the worksheet given for the chapter.

TEXT BOOK ANSWERS

Objective Type Questions

1. Name the following :

- | | |
|---------------------------------|-------------------------------|
| (a) Microscope | (b) Viruses |
| (c) Ringworm and athlete's foot | (d) Penicillin; 'Pencillium' |
| (e) Blue green algae | (f) Female Anopheles mosquito |
| (g) Cholera | (h) Fruits and Vegetables |
| (i) Sodium metabisulphite | (j) Rhizobium |
| (k) Beans, pea plant | |

2. Fill in the following blanks with suitable words:

- (a) yeast (b) nitrogen (c) microscope (d) bacteria
(e) meat ; fish (f) milk (g) constant

3. Match the micro-organisms in column A with their action in column B :

- (a) v (b) i (c) ii (d) iii
(e) iv (f) vi (g) vii

Subjective Type Questions

Short Answer Type Questions

1. Viruses are much smaller than bacteria. Viruses do not show most of the characteristics of living things, unlike bacteria. For example, viruses do not respire, feed, grow, excrete, or move on their own. They just reproduce. Viruses are able to reproduce if they enter a living cell.
2. Those organisms which are too small to be seen without a microscope are called micro-organisms. Bacteria and viruses are two examples.
3. (a) Mosquitoes breed in stagnant water of ponds, dirty drains, pools, ditches, and shallow lakes, etc. Mosquito acts as a carrier of disease-causing micro-organisms and spreads diseases from one person to another. The mosquito carries microbes inside its body.
(b) We can prevent (or control) the spreading of diseases like malaria and dengue caused by mosquitoes in the following ways:
 - (i) All the mosquitoes breed in water. So, the pools of stagnant water around the houses should be drained out so that mosquitoes may not breed in them. We should not let water collect in coolers, tyres, flower pots, etc. By keeping our surroundings clean and dry, we can prevent mosquitoes from breeding.
 - (ii) The windows and doors of the house should have fine iron wire mesh so that mosquitoes cannot enter the house.
 - (iii) Insecticides should be sprayed in houses periodically to kill mosquitoes.
4. (a) The process of conversion of sugar into alcohol by the action of yeast is called fermentation. Fermentation was discovered by Louis Pasteur in 1857.
(b) Yeast
5. A medicine which stops the growth of, or kills the disease-causing micro-organisms is called an antibiotic. Some of the precautions to be observed in the use of antibiotics are as follows:
 - (i) Antibiotics should be taken only on the advice of a qualified doctor.
 - (ii) A person must complete the 'full course' of antibiotics prescribed by the doctor.
 - (iii) The antibiotics should be taken in proper doses as advised by the doctor. If a person takes antibiotics in wrong doses (or when not needed), it may make the antibiotics less effective when the person might need it in future.
 - (iv) Antibiotics should not be taken unnecessarily. Antibiotics taken unnecessarily may kill the useful bacteria in the body and harm us.
6. HIV stands for 'Human Immunodeficiency Virus'. HIV causes AIDS disease. AIDS stands for Acquired Immune Deficiency Syndrome.

Long Answer Questions

1. (a) Those microbial diseases which can spread from an infected person to a healthy person through air, water, food or physical contact, etc., are called communicable diseases. In communicable diseases, the disease-causing germs (or infection) get transmitted from a human being, an animal or the environment to another human being. Some of the examples of communicable diseases are : Common cold, Cholera.

(b) The communicable diseases can occur and spread in the following ways :

 - (i) by breathing of air containing micro-organisms,
 - (ii) by taking infected food or water,
 - (iii) through insect bites (such as mosquito bites),
 - (iv) by sharing infected injection needles, and

atmosphere (or air) contains nitrogen gas. The nitrogen-fixing bacteria (present in the soil and in the root nodules of leguminous plants), blue-green algae and lightning in the sky fix nitrogenous gas from the atmosphere and convert it into compounds of nitrogen which go into soil. The plants take compounds of nitrogen from the soil for their growth. The plants absorb the nitrogenous compounds from the soil through their roots. The plants convert the compounds of nitrogen into plant proteins and other organic compounds which make up the body of plants.

5. Refer figure on Page no.47. Nitrogen gas of atmosphere gets fixed through the action of lightning in the sky. When lightning takes place in the sky during thunderstorm, a high temperature is produced in the atmosphere. At this high temperature, nitrogenous gas of air combines with oxygen gas of air to form nitrogenous compounds. These nitrogenous compounds dissolve in rain water, fall to earth with rain water and go into the soil.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (c) | 2. (b) | 3. (a) | 4. (b) | 5. (d) |
| 6. (c) | 7. (b) | 8. (d) | 9. (b) | 10. (d) |
| 11. (c) | 12. (b) | | | |

Case Based Questions

1. Protozoa, *Plasmodium*
2. Mosquito
3. (i) Mosquito net should be used while sleeping.
(ii) Oil should be sprayed on the surface of water in dirty water drains to kill the larvae of mosquitoes. (Students can give their own answers also.)

Assertion-Reason Based Questions

1. (c) Viruses lie on the border dividing living things and non-living things as they behave as nonliving things outside the cell and become living things as they enter the cell.
2. (d) A is incorrect but R is correct.
3. (a) Assertion and reason both are correct and reason is the correct explanation for assertion.
4. (a) Assertion and reason both are correct and reason is the correct explanation for assertion.



21st Century Skills

1. (a) Food poisoning (b) Micro-organisms (like bacteria and fungi) present in spoilt dish of mutton
2. Amoeba: Protozoa ; *Lactobacillus* : Bacteria ; *Chlamydomonas* : Algae ; *Penicillium* : Fungi ; Yeast : Fungi ; HIV : Virus
3. (a) (i) *Aedes* mosquito (ii) Dengue (b) (i) *Anopheles* mosquito (ii) *Plasmodium* (iii) Malaria
(c) Female (d) Female
4. (a) Fungus (b) Bacteria (c) Virus

Name: Class: Date:

A. Objective Type Questions

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- Blue-green algae present in the soil fix gas into nitrogenous compounds.
- A disease which spreads through air, water, food and physical contact is termed as disease.
- Cholera is caused by
- Meat and fish are preserved using
- The food material preserved using the method of pasteurisation is

2. Name the following:

- The instrument needed to see micro-organisms.
- A human disease caused by bacteria.
- A biological nitrogen fixer.
- An antibiotic extracted from fungus.
- The scientist who discovered vaccine for small pox.

B. Short Answer Type Questions

- Name the instrument which is needed to see the micro-organisms.
- Name any two human diseases caused by:
(a) Bacteria (b) Viruses (c) Protozoa (d) Fungi
- How do houseflies carry disease causing microbes? State any two ways to prevent diseases spread by houseflies.
- What is meant by fermentation? Which micro-organism converts sugar into alcohol during this process? Name the scientist who discovered fermentation.
- Why are antibiotics not effective against common cold and flu?
- What is the full form of HIV? Name the disease caused by it.
- What is food poisoning? How is it caused?
- What is meant by food preservation? Name any five methods of preservation of food.
- Describe the method of pasteurization for the preservation of milk.
- Which disease is spread by:
(a) Female Aedes mosquito?
(b) Female Anopheles mosquito?

3

Coal and Petroleum

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Classify resources in two groups- exhaustible and inexhaustible resources.
- Define fossil fuels.
- Explain the formation of coal.
- List uses of coal and useful products obtained by its destructive distillation.
- Explain the formation, occurrence and extraction of petroleum.
- List the uses of different products obtained by refining of petroleum.
- Recognize what constitutes the natural gas and identify its advantages as a fuel.
- List the different uses of natural gas.
- Identify the need and ways of conserving energy resources.

Textbook: Refer to pages 52 to 62

Periods allocated: 14 periods

VOCABULARY

Inexhaustible natural resource, exhaustible natural resource, fossil, fossil fuels, coal, petroleum, refining, natural gas, petrochemicals.

ACTIVITIES FOR PERIOD 1

Inexhaustible and exhaustible natural resources (Page 52)

Learning Tools

Interactive warm up exercise: Discussing the names of natural resources would be good start for the topic. Ask students which natural resources are available in unlimited quantity in nature.

Chapter opening exercise: Students should be asked to name the natural resources which are available in limited quantity in nature and can be exhausted by human activities.

Teacher guided discussion

Discuss with the students that those natural resources which are present in unlimited quantity in nature and are not likely to be exhausted by human activities are called inexhaustible natural resources. Students should be able to give examples of inexhaustible natural resources. Explain them that those natural resources which are present in limited quantity in nature and are likely to be exhausted by human activities are called exhaustible natural resources. Students should be able to give examples of exhaustible natural resources. They should be able to define fossils and fossil fuels and cite their examples.

Suggested home assignment

How fossil fuels were formed?

NEP

Experiential learning through outdoor activity: The teacher can take the students out on school campus walk.

They are asked to prepare a list of items they observe around them.

They are further asked to classify the substances they observed as natural or man made resources.

ACTIVITIES FOR PERIODS 2 AND 3

Coal (Page 53)

Teacher guided discussion

Discuss with the students that coal is a hard, black combustible material that consists mainly of carbon. Explain the process of carbonisation to students. Students should know that coal is a source of energy and list its uses. Discuss in detail the products of coal like coal gas, coal tar and coke along with their uses.

Suggested home assignment

Name the products of coal and list their characteristics.

ACTIVITIES FOR PERIODS 4 AND 5

Petroleum (Page 55)

Teacher guided discussion

Explain to the students that petroleum is a dark colored thick crude oil which is found deep below the ground in certain areas. Discuss the formation, occurrence and extraction of petroleum in detail with the students. Explain that the process of separating crude petroleum oil into different useful fractions is called refining and is done by fractional distillation. Students should be able to list the names of various fractions of petroleum and their uses. Students should also be able to mention the advantages of using LPG.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

State the advantages of Liquefied Petroleum Gas.

NEP

Local Knowledge: The teacher can ask the students to observe and identify the different petrochemical products used at their home.

ACTIVITIES FOR PERIOD 6 AND 7

Natural gas (Page 57)

Teacher guided discussion

Discuss with the students that natural gas consists mainly of methane with small quantities of ethane and propane. Students should know its process of formation, occurrence and places of reserves in India. They should be familiarized with the formation of Compressed Natural Gas, its advantages and uses.

Suggested home assignment

What is the full form of CNG? What are its uses?

ACTIVITIES FOR PERIOD 8 AND 9

Petrochemicals (Page 58)

Teacher guided discussion

Explain them that those chemicals which are obtained from petroleum and natural gas are called petrochemicals. Students should be able to give examples and list their uses. Sensitise students with the fact that the amount of coal, petroleum and natural gas present in the earth is limited and thus they should be used with care and caution. Suggest them ways to minimise the wastage of petrol and diesel.

Suggested home assignment

Why should we use fossil fuels with care and caution?

NEP

21st Century skills: The teacher can ask the students to collect information from internet, magazines, newspapers and discuss about the exploitation of energy sources and its affect on the environment.

ACTIVITIES FOR PERIOD 10

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 11 AND 12

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 13 AND 14

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following:

- | | | |
|---|-----------------|-----------------------------|
| (a) Coke | (b) Coal tar | (c) Coal tar |
| (d) Bitumen | (e) Kerosene | (f) Liquefied Petroleum Gas |
| (g) Methane | (h) Natural gas | (i) Bihar, West Bengal |
| (j) Petroleum Conservation Research Association | | |

2. Fill in the following blanks with suitable words:-

- | | | |
|------------|------------------------|--------------|
| (a) carbon | (b) carbonisation | (c) refining |
| (d) CNG | (e) pollution; warming | |

3. State whether the following statements are true or false :-

- | | | | | |
|----------|----------|-----------|-----------|-----------|
| (a) True | (b) True | (c) False | (d) False | (e) False |
|----------|----------|-----------|-----------|-----------|

Subjective Type Questions

Short Answer Type Questions

- Fossil fuels are exhaustible natural resources because once all the fossil fuels are used up, they will be gone forever.
- About 300 million years ago, the earth had dense forests in low-lying wet land areas. Due to natural processes like earthquakes, volcanoes and floods, etc., these forests were buried under the surface of earth. As more soil deposited over them, they were compressed. The temperature also rose as they sank deeper and deeper. Due to high pressure and high temperature inside the earth, and in the absence of air, the wood of buried forest plants and trees was slowly converted into coal. The slow process by which the dead plants buried deep under the earth have become coal is called carbonisation.
- When heated in air, coal burns and produces mainly carbon dioxide gas. A lot of heat energy is also produced during the burning of coal.

Uses of Coal

- (i) Coal is used as a fuel in homes and industry.
 - (ii) Coal is used as a fuel at Thermal Power Plants for generating electricity.
 - (iii) Coal is used to make coal gas which is an important industrial fuel.
 - (iv) Coal is used to make coke.
 - (v) Earlier, coal was used as a fuel to make 'steam' to run steam engines of trains.
 - (vi) Coal was also used as a source of organic chemicals.
4. Coal gas is mainly a mixture of methane and hydrogen, with some carbon monoxide. Coal gas is used as a fuel in industries (which are situated near the coal processing plants).
5. The refining of petroleum gives the fractions (or products) such as petroleum gas, petrol, kerosene, diesel, lubricating oil, paraffin wax and bitumen. The important uses of the various fractions of petroleum are given below.
- (i) PETROLEUM GAS. Petroleum gas is used as a fuel in homes and industry. Petroleum gas is used as a fuel as such or in the form of Liquefied Petroleum Gas (LPG).
 - (ii) PETROL. Petrol is used as a fuel in light motor vehicles (such as cars, motorcycles, and scooters, etc.).
 - (iii) KEROSENE. Kerosene is used as a fuel in wick stoves and pressure stoves to cook food.
 - (iv) DIESEL. Diesel is used as a fuel in heavy motor vehicles (such as buses, trucks, tractors, and diesel train engines).
 - (v) LUBRICATING OIL. Lubricating oil is used for lubrication in machines and engines (like car engines).
 - (vi) PARAFFIN WAX. Paraffin wax is used for making candles, vaseline, ointments, wax paper, and grease.
 - (vii) BITUMEN. Bitumen is used for road surfacing. It is also used for water-proofing the roofs of buildings. Bitumen is used in making black paints.
6. 1. Natural gas is used as a domestic and industrial fuel.
2. Natural gas is used as a fuel in Thermal Power Stations for generating electricity.
3. Compressed natural gas (CNG) is being used increasingly as a fuel in transport vehicles (like cars, buses, etc.) in place of petrol and diesel.
4. Natural gas is used as a source of hydrogen gas needed to manufacture fertilisers.
5. Natural gas is used as a starting material for the manufacture of a number of chemicals (which are called petrochemicals).
7. Liquefied petroleum gas (LPG) is a good fuel because of its following advantages :
(i) It burns easily.
(ii) It has a high calorific value. Due to this, a given amount of LPG produces a lot of heat.
(iii) It burns with a smokeless flame and hence does not cause air pollution.
(iv) It does not produce any poisonous gases on burning.
(v) It does not leave behind any solid residue on burning.
8. Petroleum is not only a source of fuels but also provides raw materials (in the form of petrochemicals) to manufacture a large number of useful substances. Due to its great commercial importance, petroleum is also called "black gold".

9. (i) PETROLEUM GAS. Petroleum gas is used as a fuel in homes and industry. Petroleum gas is used as a fuel as such or in the form of Liquefied Petroleum Gas (LPG).
- (ii) PETROL. Petrol is used as a fuel in light motor vehicles (such as cars, motorcycles, and scooters, etc.).
- (iii) DIESEL. Diesel is used as a fuel in heavy motor vehicles (such as buses, trucks, tractors, and diesel train engines).
- (iv) LUBRICATING OIL. Lubricating oil is used for lubrication in machines and engines (like car engines).
- (v) BITUMEN. Bitumen is used for road surfacing. It is also used for water-proofing the roofs of buildings. Bitumen is used in making black paints.
10. The burning of fossil fuels is a major source of air pollution. The various tips for minimising the wastage of petrol and diesel while driving vehicles are as follows :
- Drive the vehicle at a constant and moderate speed as far as possible.
 - Switch off the vehicle's engine at traffic lights or at a place where a person has to wait.
 - Ensure correct air pressure in the tyres of the vehicle. Low tyre pressure consumes more fuel.
 - Ensure regular maintenance of the vehicle (including engine tuning).

Long Answer Type Questions

1. (a) Those natural resources which are present in unlimited quantity in nature and are not likely to be exhausted by human activities are called inexhaustible natural resources. The examples of inexhaustible natural resources are: Sunlight, Air and Water. There is a never ending supply of inexhaustible resources in nature.
- (b) Those resources which are present in a limited quantity in nature and can be exhausted by human activities are called exhaustible natural resources. The examples of exhaustible natural resources are: Coal, Petroleum, Natural gas, Minerals, Forests and Wildlife, etc. The exhaustible natural resources do not last forever.
2. (a) The natural fuels formed from the remains of living organisms buried under the earth long, long ago, are called fossil fuels. Coal, petroleum and natural gas are fossil fuels.
- (b) Fossil fuels were formed from the dead remains of living organisms (plants and animals) buried under the earth millions of years ago. The plants and animals which died millions of years ago, were gradually buried deep in the earth and got covered with sediments like mud and sand, away from the reach of air. In the absence of air, the chemical effects of heat, pressure and bacteria, converted the buried remains of plants and animals into fossil fuels like coal, petroleum and natural gas.
3. (a) Petroleum is a dark coloured, thick crude oil found deep below the ground in certain areas. It has an unpleasant odour. It is called petroleum because it is found under the crust of earth trapped in rocks. Petroleum is not a single chemical compound. Petroleum is a complex mixture of compounds known as hydrocarbons (Hydrocarbons are compounds which are made up of only two elements: carbon and hydrogen).
- (b) Petroleum (oil) was formed by the decomposition of the remains of tiny plants and animals buried under the sea millions of years ago. It is believed that millions of years ago, the tiny plants and animals which lived in the sea, died. Their dead bodies sank to

the bottom of sea and were soon covered with mud and sand. Due to high pressure, heat, action of bacteria, and in the absence of air, the dead remains of tiny plants and animals were slowly converted into petroleum. The petroleum thus formed got trapped between two layers of impervious rocks (non-porous rocks), forming an oil deposit.

4. (a) Those chemicals which are obtained from petroleum and natural gas are called petrochemicals. Some examples of petrochemicals are : methyl alcohol, ethyl alcohol.
- (b) Petrochemicals are very important because they are used to manufacture a wide range of useful materials such as : Detergents, Synthetic fibres (like Polyester, Nylon, Acrylic, etc.), Plastics (such as Polythene, Polyvinyl chloride, Bakelite, etc.), Synthetic rubber, Drugs, Dyes, Perfumes, Fertilisers, Insecticides and Explosives, etc. Hydrogen gas is obtained as a petrochemical from natural gas. Hydrogen gas obtained from natural gas is used in the manufacture of fertilisers (such as ammonium nitrate and urea).

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (c) | 2. (d) | 3. (c) | 4. (c) | 5. (b) |
| 6. (d) | 7. (c) | 8. (d) | 9. (c) | 10. (c) |
| 11. (b) | 12. (c) | | | |

Case Based Questions

1. Naphthalene (mothballs) obtained from coal tar.
2. (a) Mothballs come from coal tar. Coal tar is obtained by destructive distillation of coal.
(b) Destructive distillation of coal gives coal gas and coke.
3. Coke is almost a pure form of carbon. It is used as a reducing agent in the extraction of metals like iron and zinc. (Students can give their own answers also.)

Assertion-Reason Based Questions

1. (d) A is incorrect but R is correct.
2. (d) Fossil fuels cannot be prepared in laboratory because formation of fossil fuels is a very, very slow process which requires special conditions. These conditions cannot be created in laboratory.
3. (b) Assertion and reason both are correct and but reason is not the correct explanation of assertion.
4. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.



21st Century Skills

1. (a) (i) Petroleum (ii) Natural gas (b) (i) Thick liquid (ii) Gas (c) Fractional distillation
(d) Kerosene
2. (a) Coal (b) (i) Solid (ii) Black (c) (i) Carbonisation (ii) Destructive distillation
(d) (i) Coke (ii) Coal gas (iii) Coal tar
3. P: Natural gas ; Q : Methane ; R : Hydrogen ; S : Compressed natural gas (CNG)

WORKSHEET– CLASS 8, CHAP. 3 COAL AND PETROLEUM

Name: Class: Date:

A. Objective Type Questions

1. The major component of LPG is:

- | | |
|--------------|---------------------|
| (a) Hydrogen | (b) Carbon monoxide |
| (c) Butane | (d) Methane |

2. The major component of CNG is:

- | | |
|-------------|-------------|
| (a) Butane | (b) Methane |
| (c) Propane | (d) Ethane |

3. Which of the following is used as a source of hydrogen gas for the manufacture of fertilizers?

- | | |
|--------------|-------------------|
| (a) Biogas | (b) Natural gas |
| (c) Coal gas | (d) Petroleum gas |

4. Which of the following has been termed as “black gold”?

- | | |
|---------------|--------------|
| (a) Coke | (b) Coal tar |
| (c) Petroleum | (d) Coal |

5. Identify the material used as a reducing agent in the extraction of iron metal.

- | | |
|-------------|--------------|
| (a) Bitumen | (b) Coal |
| (c) Coke | (d) Charcoal |

6. Which of the following has highest calorific value?

- | | |
|-----------------|--------------|
| (a) Natural gas | (b) LPG |
| (c) Coal gas | (d) Hydrogen |

7. An exhaustible natural resource is:

- | | |
|--------------|--------------|
| (a) Wind | (b) Water |
| (c) Wildlife | (d) Sunlight |

8. A tough, porous and black solid substance prepared by heating coal in absence of air:

- | | |
|------------|-----------------|
| (a) Coke | (b) Coal gas |
| (c) Naptha | (d) Natural gas |

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) Coal contains mainly
- (b) The process of separating different constituents from petroleum is
- (c) The full form of PCRA is
- (d) The least polluting fuel for vehicles is
- (e) The fuel which is used in jet aircraft engines is

2. Name the following:

- (a) The product of coal which is used as a reducing agent in the extraction of metals.
- (b) An important source from which naphthalene balls are obtained.
- (c) A fossil fuel other than coal and petroleum.
- (d) A place in India where coal is found.
- (e) The petroleum product used for the resurfacing of roads.

B. Short Answer Type Questions

1. What is the full form of:

- (a) LPG
- (b) CNG

2. What happens when coal is heated in air?

3. State the uses of coal and coke.

4. What is coal gas? Mention its use.

5. What are the major products obtained in petroleum refining? Give one use of each product.

6. Where is natural gas found? Why is it called a clean fuel?

7. What are the advantages of using LPG as fuel?

8. What is petroleum? Where does it occur?

9. What are petro-chemicals? Name any two petro-chemicals.

4

Combustion and Flame

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Explain the combustion process & classify substances as combustible or non-combustible.
- List the conditions necessary for combustion.
- Identify the different ways used to control fire.
- Name and compare the three types of combustion reactions.
- Define the term fuel and list examples of solid, liquid and gaseous fuels.
- Relate fuel efficiency with calorific value & list the characteristics of an ideal fuel.
- Outline the structure of a flame.
- Recognize that burning of fuels leads to the formation of harmful products.

Textbook: Refer to pages 63 to 81

Periods allocated: 16 periods

VOCABULARY

Combustion, combustible substance, non-combustible substance, ignition temperature, matchstick, fire-fighting, rapid combustion, spontaneous combustion, explosive combustion, fuel, calorific value, flame, global warming.

ACTIVITIES FOR PERIOD 1 TO 3

Combustion, combustible and non-combustible substances (Page 63)

Learning Tools

Interactive warm up exercise: Discussing the process of burning of Magnesium ribbon in air would be a good start for the topic. Ask students why air is necessary for the burning of magnesium to take place.

Chapter opening exercise: Students should be asked to list some common examples of chemical processes like respiration where burning takes place in the presence of air (oxygen) to produce heat or other forms of energy along with the main products.

Teacher guided discussion

Discuss that a chemical process in which a substance reacts with the oxygen of air to give heat and light is called combustion. Students should be able to cite examples of combustion. Familiarize them with the classification of substances into combustible (which can burn) and non-combustible (which cannot burn).

Suggested home assignment

Differentiate between combustible and non-combustible substances and give examples.

ACTIVITIES FOR PERIODS 4 AND 5

Conditions necessary for combustion (Page 65)

Teacher guided discussion

Discuss with the students that there are three conditions which are necessary for combustion to take place: presence of a combustible substance, presence of supporter of combustion like air and heating the combustible substance to its ignition temperature. Students should be familiarized that the lowest temperature at which a substance catches fire and starts burning is called ignition temperature. Students should be able to give examples of substances which have high and low ignition temperature. They should be able to explain why coal cannot be burnt by using a simple matchstick and how forest fires occur during the hottest summer days. The topic can be made interesting by discussing the history of matchstick with students.

Using resources

- Conduct the activity given on page no. 65 of the book to show that air is necessary for combustion.
- Conduct the activity given on page no. 68 of the book to explain the concept of ignition temperature.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

List the names of substances having low ignition temperature and high ignition temperature. Out of alcohol and charcoal, which one will catch fire quickly and why?

ACTIVITIES FOR PERIOD 6

How do we control fire (Page 69)

Teacher guided discussion

Explain them that burning produces fire and the process of extinguishing fire is called fire-fighting. Students should be able to state the three essential things (fuel, air and heat) for fire to start and they should be able to comprehend that if these three things are removed, fire will stop.

Suggested home assignment

Explain how carbon dioxide fire extinguisher functions and when is it used.

NEP

Experiential learning through outdoor activity: The teacher can ask the students to visit shops, factories, and other buildings near their home and observe the type and location of fire extinguishers available there. Also ask them to count the fire extinguishers available there & make a report about preparedness of these establishments to fight fire.

ACTIVITIES FOR PERIOD 7 AND 8

Types of combustion (Page 70)

Teacher guided discussion

Discuss with the students that the three important types of combustion are: Rapid combustion, spontaneous combustion and explosive combustion. Students should be able to differentiate between these three types of combustion.

Suggested home assignment

Differentiate between rapid combustion and explosive combustion.

ACTIVITIES FOR PERIOD 9 AND 10

Fuels (Page 71)

Teacher guided discussion

Discuss with the students that the material which is burnt to produce heat is called a fuel. Students should be able to give examples of solid fuels, liquid fuels and gaseous fuels. Explain that the amount of heat produced by the complete burning of 1 kilogram of a fuel is called its calorific value and is expressed in kJ/kg. Discuss the characteristics of an ideal fuel.

Suggested home assignment

Mention the characteristics of an ideal fuel.

NEP

Local Knowledge: The teacher can ask the students to observe common fuels used at their home and classify them on the basis of their physical state.

ACTIVITIES FOR PERIOD 11 AND 12

Flame (Page 73)

Teacher guided discussion

Discuss with them that a flame is a region where combustion of gaseous substances takes place. Students should be able to name the substance which produce a flame and which do not. Discuss the structure of flame which consists of three zones: innermost dark zone, middle yellow zone and the outer blue zone.

Using resources

Conduct the activities given on page no. 75 and 76 to show the three zones of the candle flame.

Suggested home assignment

Draw the three zones of a candle flame (Fig.14).

ACTIVITIES FOR PERIOD 13

Burning of fuels leads to harmful products (Page 76)

Teacher guided discussion

Discuss with them that the burning of fuels produces harmful products which pollute the air around us. Students should be able to mention the harmful effects produced by the burning of fuels. Students should be able to state how LPG is a better fuel than wood.

Suggested home assignment

Why is LPG being commonly used as a fuel nowadays?

NEP 21st Century skills: The teacher can ask the students to explore internet and find out about the detrimental effects of using wood as a fuel, especially in rural areas.

ACTIVITIES FOR PERIOD 14

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 15

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 16

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following:

- | | |
|---|----------------------------|
| (a) Water | (b) White Phosphorous |
| (c) kJ/kg | (d) Mustard Oil ; Wax, LPG |
| (e) (i) Black (ii) Yellow (iii) Blue | (f) Carbon dioxide |
| (g) Carbon monoxide | (h) CNG |
| (i) Petrol and alcohol; Coal and Charcoal | |

2. Fill in the blanks with suitable words:

- | | | |
|--------------------------|---------------------|------------|
| (a) ignition temperature | (b) air | (c) water |
| (d) kerosene | (e) calorific value | (f) flames |
| (g) pollution | | |

Subjective Type Questions

Short Answer Type Questions

1. (a) A material which is burnt to produce heat is called a fuel. Some of the common fuels are: Wood, Coal, LPG (Cooking gas), Kerosene, Petrol, Diesel, Natural gas and Biogas.
(b) The characteristics of ideal fuel are as follows:
 - (i) It has a high calorific value, i.e., it produces a large amount of heat (per unit mass).
 - (ii) It burns easily in air at a moderate rate., i.e., it burns neither too fast nor too slow.
 - (iii) It has a proper ignition temperature (which is neither very low nor very high).
 - (iv) It does not produce any harmful gases or leaves any residue after burning (which may pollute the environment).
2. (a) The amount of heat produced by the complete burning (or complete combustion) of 1 kilogram of a fuel is calorific value.
(b) By saying that the calorific value of LPG is 55000 kJ/kg, we mean that if 1 kilogram of LPG is burnt completely, then it will produce 55000 kilojoules of heat energy.
3. The large heat produced by the burning wood pieces heats the coal to its ignition temperature due to which the coal also starts burning.
4. (a) The combustion reaction in which a large amount of heat and light are produced in a short time is called rapid combustion. The burning of kerosene oil in a kerosene stove and the burning of wax in a candle are also examples of rapid combustion.
(b) The combustion reaction which occurs on its own (without the help of any external heat), is called spontaneous combustion. The burning of white phosphorus on its own at room temperature is an example of spontaneous combustion.
(c) A very fast combustion reaction, in which a large amount of heat, light and sound are produced, is called explosive combustion (or explosion). The fireworks (crackers, etc.) which we explode during festivals work on the explosive combustion of substances.
5. Light a candle with a burning matchstick and fix it on a table. We will see that this candle keeps on burning. This uncovered candle keeps burning because it is getting continuous supply of fresh air from the surroundings. We now cover the burning candle with an inverted glass jar. We will see that the candle stops burning after some time. In other words, the candle gets extinguished. The candle stops burning (or gets extinguished) because the supply of fresh air to the burning candle is cut off by the glass jar cover. Since no fresh air is available to the burning candle, it stops burning (or gets extinguished). This observation shows that air is necessary for combustion (or burning) to take place.
6. The process of rusting of iron is an example of slow combustion. The rusting liberates very little heat but no light.

7. The fires caused by the burning of inflammable materials like oil or petrol are extinguished by using carbon dioxide fire extinguishers.
8. We should never sleep in a room with closed door and windows, and having a coal fire burning inside. This is because when coal burns in an insufficient supply of air in the room (due to closed door and windows), then a lot of carbon monoxide gas is produced. When the persons sleeping in this room breathe in poisonous carbon monoxide gas, they may all die.
9. (a) A flame is a region where combustion (or burning) of gaseous substances takes place. All the gases which undergo combustion (or burn) produce flame. But only those solid and liquid fuels which vaporize on being heated, burn with a flame. In other words, only those solid and liquid fuels which form gases on being heated, burn with a flame.
(b) Wax candle has wick. Molten wax rise through the wick, get vaporised during burning and form flames. On the other hand, coal is a solid fuel which does not vaporise on heating. So, coal also does not burn by producing a flame.
10. Carbon dioxide gas is denser than air and forms a layer around the burning substances. Carbon dioxide layer covers the fire like a blanket due to which fresh air cannot reach the burning substances. The burning substance does not get oxygen of air and hence stops burning. In this way, the fire gets extinguished.
11. (i) Some of the examples of *solid fuels* are : Wood, Charcoal
(ii) The examples of *liquid fuels* are : Kerosene, Petrol
(iii) The examples of *gaseous fuels* are : Natural gas, Petroleum
12. A flame consists of three zones (or three parts). These are : innermost zone, middle zone and outer zone. (a) middle zone (b) outermost zone
13. Goldsmiths blow air with a blow-pipe to intensify a kerosene lamp flame for melting and moulding the pieces of gold and silver into desired shapes to make jewellery. When air is blown through blow-pipe into the flame, it helps in the combustion of unburnt fuel and hence makes the flame hotter.
14. This is because when CNG burns, it produces very small amount of harmful products. CNG is a clean fuel because it burns without producing smoke. Since the burning of CNG produces much less harmful products and smoke, therefore, the use of CNG as fuel in automobiles has reduced air pollution in our cities.
15. (a) (i) LPG has a much higher calorific value than wood, so it produces much more heat on burning than an equal mass of wood.
(ii) LPG burns without producing any smoke but burning of wood produces a lot of smoke.
(iii) LPG burns completely without leaving behind any solid residue but wood leaves behind a lot of ash on burning.
(b) The green leaves contain a lot of water. This water does not allow the green leaves to get heated to their ignition temperature easily and makes the burning of green leaves difficult. On the other hand, since dry leaves do not contain water, they get heated to their ignition temperature easily and hence catch fire easily.

Long Answer Type Questions

1. (a) Those substances which can burn are called combustible substances. In other words, those substances which can undergo combustion are called combustible substances. Some of the combustible substances are : Paper, Cloth (Fabrics), Straw (Dry grass), Cooking gas (LPG), CNG, Kerosene oil, Wood, Charcoal, Coal, Cowdung cakes, Petrol, Diesel, Alcohol, Matchstick and Magnesium ribbon, etc. A combustible substance is also called a fuel.
(b) Those substances which do not burn are called non-combustible substances. In other words, those substances which do not undergo combustion are called non-combustible substances. Some of the non-combustible substances are : Stone, Glass, Cement, Bricks, Soil, Sand, Water, Iron nails, Copper objects and Asbestos, etc.
2. (a) A chemical process in which a substance reacts with the oxygen (of air) to give heat and light is called combustion. If a magnesium ribbon is heated, it starts burning (or undergoes combustion). When a magnesium ribbon burns, it combines with the oxygen of air to form magnesium oxide, and liberates heat and light.
(b) The three conditions which are necessary for combustion to take place are:
 1. Presence of a combustible substance (A substance which can burn)
 2. Presence of a supporter of combustion (like air or oxygen)
 3. Heating the combustible substance to its ignition temperature
3. (a) Refer to Figure 14.
(b) The fuel vapours burn partially in the middle zone because there is not enough air for burning in this zone. The partial (or incomplete) burning of fuel in the middle zone produces carbon particles. These carbon particles become white hot and emit light. So, it is the glow of hot carbon particles which makes the middle zone of a flame luminous (or light-giving). These carbon particles then leave the flame as smoke and soot. The middle zone (or luminous zone) of a flame produces a moderate temperature. This zone is the major part of a candle flame.
4. Increased percentage of carbon dioxide in air is causing global warming. This happens as follows : Carbon dioxide gas in the air traps sun's heat rays by producing greenhouse effect. Global warming is the rise in temperature of earth's atmosphere caused by the excessive amounts of carbon dioxide in the air. Due to rise in the temperature of atmosphere, the ice in polar regions will melt very fast, producing a lot of water. This water may cause a rise in the sea-level leading to floods in coastal areas. The low-lying coastal areas may be completely submerged under water leading to the loss of life and property.
5. Sulphur dioxide is an extremely suffocating and corrosive gas. It may damage our lungs. The burning of petrol and diesel in the engines of vehicles also releases nitrogen oxides into the air. Sulphur dioxide and nitrogen oxides produced by the burning of fuels dissolve in rain water and form acids. The rain water containing acids is called acid rain. Acid rain is very harmful for forests, aquatic animals and buildings.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (b) | 2. (c) | 3. (b) | 4. (c) | 5. (b) |
| 6. (c) | 7. (b) | 8. (c) | 9. (c) | 10. (c) |
| 11. (c) | 12. (b) | | | |

Case Based Questions

1. Compressed Natural Gas
2. Rihan called CNG a clean fuel because it burns without smoke and produces very less harmful products.
3. Burning petrol and diesel produces oxides of sulphur and nitrogen which dissolves in water and produces acids. These acids come down as acid rain and pollute the environment.

Assertion-Reason Based Questions

1. (a) A and R both are correct and R is the correct explanation of A.
2. (d) The fires caused by electrical short-circuit in an electrical appliance or in electric wiring should not be extinguished by throwing water as water conducts electricity. A is incorrect but R is correct.
3. (c) The burning of cooking gas produces heat and light in a short period of time. It is an example of rapid combustion. A is correct but R is incorrect.
4. (a) A and R both are correct and R is the correct explanation of A.



21st Century Skills

1. No, the petrol will not catch fire. This is because in a closed tank full of petrol , there is no supporter of combustion like air which can make the petrol catch fire and burn.
2. When paper is heated alone, its ignition temperature is reached quickly due to which it catches fire easily. When the paper wrapped around an aluminium pipe is heated, then the heat supplied to paper is transferred to aluminium pipe by conduction. Due to the continuous transfer of heat from paper to aluminium pipe, the paper does not get heated to its ignition temperature quickly and hence does not catch fire easily.
3. Ramesh's water will get heated in a shorter time because the outermost part of the candle flame is the hottest part of flame
4. (a) Sodium bicarbonate (Sodium hydrogen carbonate) (b) The heat of fire decomposes sodium bicarbonate to produce carbon dioxide gas. This carbon dioxide covers the fire like a blanket and cuts off supply of fresh air to the burning substance. Due to this the fire gets extinguished (c) Potassium bicarbonate (or Potassium hydrogen carbonate)
5. (a) Spontaneous combustion (b) Rapid combustion (c) Explosive combustion (or Explosion) (d) Spontaneous combustion.

Name: Class: Date:

A. Objective Type Questions

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) The most common fire extinguisher is
- (b) A fuel must be heated to its before it starts burning.
- (c) A liquid fuel used in our homes is
- (d) The substances which vaporize during burning produce
- (e) The burning of wood and coal causes of air.

2. Name the following:

- (a) The unit in which calorific value of a fuel is expressed.
- (b) The fuel which is gradually replacing petrol and diesel in automobiles.
- (c) The very poisonous gas which is produced by the incomplete combustion of fuels.
- (d) A substance having low ignition temperature.
- (e) A fuel which burns without producing a flame.

B. Short Answer Type Questions

1. Give reasons for the following:

- (a) It is difficult to burn a heap of green leaves but dry leaves catch fire easily.
- (b) When a burning candle is covered with an inverted glass jar, the candle gets extinguished after some time.
- (c) LPG is a better domestic fuel than wood.

2. Distinguish between:

- (a) Spontaneous combustion and explosive combustion.
- (b) Combustible and non-combustible substances.

3. Explain how:

- (a) Fire produced by burning oil/ petrol is extinguished?
- (b) Fire caused by electricity is extinguished?
- (c) Pouring of water extinguishes fire?

4. Give two examples of:

- (a) Solid fuels
- (b) Liquid fuels
- (c) Gaseous fuels

5

Conservation of Plants and Animals

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Define the terms biosphere, wildlife, biodiversity and ecosystem.
- List the causes of deforestation and its consequences.
- Explain the need of adopting measures for conserving forests and wildlife.
- Outline the role of protected areas in the conservation of forests and wildlife.
- Justify the importance of paper recycling and reforestation.

Textbook: Refer to pages 82 to 98

Periods allocated: 16 periods

VOCABULARY

Conservation, biosphere, wildlife, biodiversity, ecosystem, deforestation, biosphere reserve, wildlife sanctuary, national park, flora, fauna, species, endemic species, extinct species, endangered species, migration, recycling, reforestation.

ACTIVITIES FOR PERIOD 1 AND 2

Deforestation and its causes (Page 83)

Learning Tools

Interactive warm up exercise: Discussing with the students the importance of conservation of plants and animals which are present in forests by protecting their natural environment would be a good start for the topic.

Chapter opening exercise: Students should be asked the meaning of common terms biosphere, wildlife and ecosystem. Ask students if they have visited wildlife sanctuaries and discuss their experiences.

Teacher guided discussion

Discuss that biosphere is a part of the earth in which living organisms exist. Wildlife means all the animals and plants which are found naturally in the forests and other natural habitats. Biodiversity refers to the variety of organisms found in a particular area or habitat. An ecosystem is a system which includes all living organisms of an area and the physical environment in which they live. Students should be made to realize that the biggest threat to the existence and survival of wild animals and birds is deforestation. Explain that deforestation is the clearance of forests over a wide area. Students should know the causes of deforestation and they should be familiarized with the consequences of deforestation like increase in temperature of earth's atmosphere, soil erosion, frequent flooding of rivers, decrease in rainfall, extinction of wild animals and plants.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Mention the natural and man-made causes of deforestation.

NEP

Experiential learning through outdoor activity: The teacher can ask the students to observe the plants & animals in their neighbourhood area.

Ask them to identify the plants and animal species and write their names in separate sheets.

ACTIVITIES FOR PERIOD 3 AND 4

Conservation of forests and wildlife (Page 85)

Teacher guided discussion

Discuss with the students that we should conserve forests and wildlife to preserve biodiversity, to prevent endangered species from becoming extinct and to maintain ecological balance in nature. Explain that the purpose of establishing biosphere reserves, wildlife sanctuaries and national parks is to conserve wild animals and their natural surroundings.

Suggested home assignment

Name the three types of protected areas which have been established by the Government for the preservation of forests and wild animals.

ACTIVITIES FOR PERIOD 5 AND 6

Biosphere reserve (Page 86)

Teacher guided discussion

Explain to the students that a biosphere reserve is a large, protected area of land meant for the conservation of wildlife, biodiversity, and the traditional lifestyle of the tribal people living in the area. Students should know the three zones of biosphere reserve: innermost core zone, middle buffer zone and the outermost transition zone. Students should be familiarized with the names and locations of the 14 biosphere reserves in India. Explain the important roles of biosphere reserves to the students. Explain that the plants and animals are called the flora and fauna, respectively, of that area. Acquaint them with the term endemic species (species found exclusively in that particular area).

Suggested home assignment

Draw and explain the three zones of a biosphere reserve.

ACTIVITIES FOR PERIOD 7

Wildlife sanctuary (Page 89)

Teacher guided discussion

Discuss with the students that a wildlife sanctuary is a protected area of land which is created for the protection of wild animals in their natural environment like forests. Students should be familiarized with the names of some wildlife sanctuaries of India and their locations. Students should know the differences between biosphere reserve and wildlife sanctuary and the difference between wildlife sanctuary and zoo.

Suggested home assignment

Differentiate between biosphere reserve and wildlife sanctuary.

ACTIVITIES FOR PERIOD 8

National parks (Page 90)

Teacher guided discussion

Explain them that a national park is a relatively large area of scenic beauty protected and maintained by the Government to preserve flora and fauna, landscape, historic objects of the area and places of scientific interest. It provides human recreation and enjoyment. Discuss some prominent national parks of India and states in which they are located. Students should know the difference between a wildlife sanctuary and national park. Discuss Project Tiger in detail with students.

Suggested home assignment

How many tiger reserves have been included under the Project Tiger in India?

NEP

Life Skills (Communication): The teacher can engage the class in a discussion on the objectives of Project Crocodile and ask the students some pertaining questions like:

- In which year project crocodile was launched in India?
- How many crocodile projects are there in India?
- Where do we find crocodile project in India?
- Which is the largest reptile found in India?
- Who was the main pioneer and in which year Project crocodile was started?

ACTIVITIES FOR PERIOD 9 AND 10

Extinct species, Endangered species, Red data book and Migration (Page 91)

Teacher guided discussion

Explain them that the species which no longer exist anywhere on the earth are called extinct species. Students should be able to give examples of extinct species. The species which are facing

the risk of extinction are called endangered species. Students should be able to cite examples of endangered species. Discuss that the Red Data Book is the book which keeps a record of all the endangered species. Acquaint students with the term migration that it is the process of a bird/animal moving from one place to another according to the season; to escape the harsh and cold conditions of their normal habitat in winter so as to survive. Discuss the most common example of migration of Siberian crane with students.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Name some endangered species listed in the Red data book.

NEP

Art Integration: The teacher can ask the students to paste pictures of five most threatened animal species of the world in their scrapbook along with text strips in which information regarding how they are protected is there.

ACTIVITIES FOR PERIOD 11 AND 12

Recycling of paper and Reforestation (Page 93)

Teacher guided discussion

Explain to the students that the term recycling of paper means to process the waste paper to make new paper so that it can be used again. Discuss the importance of recycling paper with students. Explain that reforestation is the planting of trees in an area in which forests were destroyed and it is a very good answer to the problem of deforestation. Students should know the advantages of reforestation and familiarize them with the Forest Conservation Act in India.

Suggested home assignment

List the advantages of reforestation.

ACTIVITIES FOR PERIOD 13

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 14

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 15 AND 16

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type of Questions

1. Name the following :-

2. Fill in the following blanks with suitable words:-

Subjective Type Questions

Short Answer Type Questions

1. The clearing of forests (by cutting down forest trees) over a wide area is called deforestation. The various causes of deforestation (or cutting down of forest trees) are the following :
 - (i) The forest trees are cut down to obtain wood for using as fuel.
 - (ii) The forest trees are cut down to obtain wood (timber) for making doors, windows and furniture.
 - (iii) The forest trees are cut down to obtain wood for making paper.
 - (iv) The forest trees are cut down to obtain more agricultural land for cultivation of crops for the increasing population.
 - (v) The forest trees are cut down to get land for building houses, factories, roads and dams, etc.
 2. The gradual increase in the overall temperature of earth's atmosphere due to greenhouse effect caused by the increased level of carbon dioxide in the atmosphere is called global warming.
 3. (a) Biodiversity refers to the variety of organisms (plants, animals and micro-organisms, etc.) found in a particular area or habitat.
(b) An ecosystem is a 'system' which includes all the living organisms (plants, animals and microorganisms) of an area and the physical environment (soil, air and water) in which they live.
(c) Biosphere is that part of the earth in which living organisms exist (or which supports life).
 4. The purpose of establishing several Biosphere Reserves, Wildlife Sanctuaries and National Parks in India is to conserve wild animals and their natural surroundings (such as forests) so as to maintain a healthy balance in nature, and to prevent the extinction of endangered wild animals.
 5. Flora: teak, fern, *sal*, mango, *arijun* Fauna: cheetal, leopard, blue bull, barking deer, wolf.

6. Endemic species are those species (of plants and animals) which are found exclusively in a 'particular area'. *Sal* and wild mango are the two examples of the endemic flora (or endemic plants) of the Pachmarhi Biosphere Reserve. Giant squirrel and bison are the two examples of endemic fauna (endemic animals) of the Pachmarhi Biosphere Reserve area.
7. (a) 1. A Biosphere Reserve is spread over a very large area of land. A Wildlife Sanctuary occupies a comparatively smaller area of land.
2. A Biosphere Reserve is for the conservation of biodiversity of the area as well as the economic development of the area. A Wildlife Sanctuary is mainly for the protection of wild animals of the area in their natural habitat.
3. Local people (tribals) form an integral part of a Biosphere Reserve. Local people do not form an integral part of a Wildlife Sanctuary.
4. The human activities such as cultivation of land and building of settlements (houses) are allowed in the outermost zone of a Biosphere Reserve. The human activities such as cultivation of land and building of settlements (houses) are not allowed in a Wildlife Sanctuary.
- (b) 1. A Wildlife Sanctuary may or may not be an area of great scenic beauty. A National Park is an area of great scenic beauty.
2. A Wildlife Sanctuary protects and preserves the wild animals in their natural environment. A National Park protects and preserves wild animals and their environment as well as the scenic beauty, historical objects and habitats of scientific interest in the area.
3. A Wildlife Sanctuary is not meant for recreation and enjoyment of the public. It is dedicated to the protection of wild animals only. In a National Park, in addition to protection, wild animals are kept for recreation, enjoyment and educative interests of the public.
4. A Wildlife Sanctuary usually does not allow easy access to the visitors. A National Park allows easy access for the visitors to the land and wildlife inside it.
8. A National Park is a relatively large area of scenic beauty protected and maintained by the Government to preserve flora and fauna (plants and animals), landscape, historic objects of the area and places of scientific interest. Two National Parks of India are: Corbett National Park (Uttarakhand) and Sunderbans National Park (West Bengal).
9. Project Tiger is a wildlife conservation project which was launched by the Government of India in 1972 to protect the tigers in the country. The objective of this project was to ensure the survival and maintenance of the tiger population in specially constituted 'Tiger Reserves' throughout India.
10. The species which no longer exist anywhere on the earth are called extinct species. Some of the examples of extinct species of animals are: Dinosaur, Dodo. The species which are facing the risk of extinction are called endangered species. Some examples of endangered animal species are: Tiger, Snow leopard.
11. Red Data Book is the 'book' (or publication) which keeps a record of all the endangered animals, plants and other species. The advantage of maintaining Red Data Book is that we come to know which species of animals, plants, etc., are very small in number and facing the danger of extinction so that timely remedial steps can be taken by the Authorities concerned to prevent their extinction.

- 12.** Migration of birds (or other animals) is an adaptation to escape the harsh and cold conditions of their normal habitat in winter so as to survive. When the winter sets in cold regions of the earth, the climate becomes extremely cold in those regions. The birds, which normally live in these regions, migrate (fly off) to far flung warmer places on earth to escape the extremely cold winter climate and survive. And when the winter season gets over, these birds fly back to their original habitats, the cold regions.
- 13.** The planting of trees in an area in which forests were destroyed, is called reforestation. Advantages of reforestation are:
- (i) It produces a large quantity of raw materials for industry (like paper industry), timber trade, etc.
 - (ii) It will lead to a decrease in global warming by reducing the amount of carbon dioxide gas in the atmosphere.
 - (iii) It increases rainfall in an area. This will raise groundwater level and prevent droughts.
 - (iv) It prevents soil erosion and floods.
- 14.** We should 'save paper', 'reuse paper' and 'recycle paper'. By doing this, we will not only save trees but also save energy and water needed for manufacturing paper. The amount of harmful chemicals used in paper making will also be reduced.

Long Answer Type Questions

1. (a) The term 'wildlife' means all the animals and plants which are found naturally in the forests and other natural habitats. We should conserve forests and wildlife to preserve biodiversity (variety of species), to prevent endangered species from becoming extinct, and to maintain ecological balance in nature.
(b) Some of the measures which can be taken for the conservation of forests and wildlife are given below:
 - (i) The unauthorised felling (cutting) of forest trees for timber trade and fire-wood should be stopped immediately. This is because depletion of forests destroys the natural habitats of wild animals and birds, and exposes them to the cruelty of man as well as nature.
 - (ii) In case of Government authorised felling of forest trees, for every acre of forest cut down, an equal area of land should be planted with saplings of trees to make up for the loss in the long run.
 - (iii) The natural habitats of wild animals should be preserved by establishing conservation areas such as Biosphere Reserves, Wildlife Sanctuaries and National Parks where the wild animals can flourish in natural surroundings protected from the outside world.
 - (iv) A total ban should be imposed on the poaching (killing) or capturing of any wild animal or bird.
2. (a) The various **causes of deforestation** (or cutting down of forest trees) are as follows:
 - (i) The forest trees are cut down to obtain wood for using as fuel.
 - (ii) The forest trees are cut down to obtain wood (timber) for making doors, windows and furniture.
 - (iii) The forest trees are cut down to obtain wood for making paper.

- (iv) The forest trees are cut down to obtain more agricultural land for cultivation of crops for the increasing population.
 - (v) The forest trees are cut down to get land for building houses, factories, roads and dams, etc.
- (b) Forests are the natural habitats of many wild animals, birds as well as plants. When forest trees and other forest plants are cut down, the natural habitat of wild animals and birds gets destroyed. These homeless wild animals fall prey to human beings and get killed. Moreover, in the absence of forest trees and plants, the wild animals and birds do not get enough food and starve to death. In this way, many animal and bird species become extinct (or vanish) from that area.
3. (a) The roots of trees (and other plants) bind the particles of top soil together. Due to this binding of soil particles, the wind and water are not able to carry away the top soil easily. In this way, trees prevent soil erosion. The tree cover also softens the effect of heavy rains on the forest soil due to which the top soil does not become loose quickly. This is another way in which trees of the forest help prevent soil erosion. When the forest trees are cut down during deforestation, there are no roots of trees which can bind the soil particles together and prevent them from being carried away by strong winds or flowing rain water. Moreover, since there is no tree cover on the soil to soften the effect of heavy rains, the bare top soil becomes loose quickly by the force of falling rain water and erodes rapidly.
- (b) The roots of forest trees (and other forest plants) help in absorbing some of the rain water and make it percolate into the ground. This reduces the amount of rain water which rushes quickly into rivers and flooding does not occur. When the forest trees (and plants) are cut down, the percolation of rain water into soil is reduced. A lot of rain water from deforested soil rushes into the rivers quickly, causing floods. In this way, *deforestation decreases the water holding capacity of soil which leads to floods*. Another reason for the floods is the soil erosion caused by deforestation. The eroded soil is carried by flowing rain water into rivers. The eroded soil keeps on collecting on the river bed and decreases the depth of rivers gradually. Due to decreased depth, the water-carrying capacity of the river is reduced. When heavy rains occur, the river is not able to carry away all the rain water quickly. The excess water overflows from the banks of the river into the adjoining areas causing floods. These floods damage standing crops, houses and even drown people living in nearby areas.
4. (a) The forest trees put a lot of groundwater, sucked through their roots, into the atmosphere as water vapour by the process of transpiration (evaporation from the leaves). This water vapour helps in bringing rain in that area. When the forest trees are cut down, then the lesser number of trees put less water vapour into atmosphere through transpiration. Since less water vapour is put into the atmosphere, there is less rainfall in that area. When there is less rainfall in an area, then less water percolates into the ground. Due to this, the groundwater level also gets lowered. The shortage of surface water (in ponds, lakes, etc.) and groundwater due to persistent low rainfall in an area can lead to droughts (A prolonged period of abnormally low rainfall leading to severe shortage of water is called drought).
- (b) Trees (and other plants) use carbon dioxide gas from the atmosphere for the process of food making called 'photosynthesis'. When a lot of trees are cut down during

deforestation, then lesser number of trees will be left. The lesser number of trees will use up less carbon dioxide due to which the amount of carbon dioxide in the atmosphere will increase. In this way, *deforestation increases the level of carbon dioxide in the atmosphere*. Carbon dioxide gas traps the sun's heat rays reflected by the earth (causing greenhouse effect). Trapping of heat rays by carbon dioxide increases the temperature of earth's atmosphere. This will lead to global warming. The gradual increase in the over-all temperature of earth's atmosphere due to greenhouse effect caused by the increased level of carbon dioxide in the atmosphere is called global warming.

5. A Biosphere Reserve is a large, protected area of land meant for the conservation of wildlife, biodiversity, and the traditional lifestyle of the tribal people living in the area. In creating the large areas of conservation called Biosphere Reserves, the need of local people to have access to the resources of this area has been kept in mind. So, a special feature of the protected areas called Biosphere Reserves is that local people or tribals are an integral part (necessary part) of it. Thus, Biosphere Reserves jointly manage biodiversity and economic activity. The names and locations of some of the Biosphere Reserves of India are given below: Great Nicobar Biosphere Reserve (Andaman and Nicobar) and Kaziranga Biosphere Reserve (Assam).

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (b) | 2. (d) | 3. (d) | 4. (c) | 5. (d) |
| 6. (c) | 7. (d) | 8. (d) | 9. (d) | 10. (b) |
| 11. (d) | 12. (b) | | | |

Case Based Questions

1. Rizwan and his class went to Rajasthan.
2. No, cultivation of land and construction of houses is not allowed in wildlife sanctuaries like Bharatpur bird sanctuary.
3. Local people are integral part of biosphere reserve, but they are not an integral part of wildlife sanctuary. (Students can give their own answers also.)

Assertion-Reason Based Questions

1. (c) Deforestation leads to global warming because less amount of carbon dioxide is utilised from the atmosphere due to lesser number of trees. It leads to increase in average temperature of the earth.
2. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.
3. (d) Assertion is incorrect but reason is correct.
4. (c) A is correct but R is incorrect.



21st Century Skills

1. A: Oxygen ; B : Carbon dioxide ; C : Greenhouse effect ; D : Global warming
2. X : Snake ; Y: Rats ; Z : Skin
3. (a) Endemic species (b) Endangered species (c) Tiger (d) Extinct species (e) Dinosaur
4. Deforestation

Name: Class: Date:

A. Objective Type Questions

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) refers to the variety of plants, animals and micro-organisms found in an area.
 - (b) The species which are on the verge of vanishing from the earth are
 - (c) Satpura National Park is a part of Biosphere Reserve.
 - (d) Paper can be recycled to times.
 - (e) The species that have died out completely from the surface of earth are species.

2. Name the following:

- (a) First reserve forest of India
 - (b) Publication which contains record of all endangered species.
 - (c) Two bird sanctuaries in India (along with their location).
 - (d) Two national parks (along with their location).
 - (e) Two biosphere reserves.

B. Short Answer Type Questions

1. Differentiate between wildlife sanctuary and zoo.
 2. What is desertification? Which human activities lead to desertification?
 3. What is global warming? Which gas is responsible for it?
 4. Define the following terms:
 - (a) Biodiversity
 - (b) Ecosystem
 - (c) Wildlife sanctuary
 - (d) Endemic species
 - (e) National park
 - (f) Biosphere reserve
 5. Differentiate between:
 - (a) Wildlife sanctuary and National park
 - (b) Endangered species and extinct species
 6. What is “Project Tiger”? What are the objectives of this project?
 7. What are the aims of Forest Conservation Act in India?
 8. Why does Siberian crane come from Siberia to places like Bharatpur in India every year for few months?

6

Reproduction in Animals

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- List and define the 2 modes of reproduction- sexual and asexual reproduction.
- Explain sexual reproduction process in human beings.
- Identify the male and female reproductive organs in humans.
- Outline the steps of in vitro fertilisation.
- Illustrate metamorphosis in frog and silk moth.
- Explain different methods of asexual reproduction in animals.
- Identify how cloning take place in animals and list its advantages.

Textbook: Refer to pages 99 to 119

Periods allocated: 15 periods

VOCABULARY

Reproduction, gametes, asexual reproduction, sexual reproduction, sperms, ova, zygote, fertilisation, testes, ovary, embryo, foetus, in-vitro, viviparous, oviparous, metamorphosis, binary fission, budding, cloning, clone.

ACTIVITIES FOR PERIODS 1 AND 2

Methods of reproduction (Page 100)

Learning Tools

Interactive warm up exercise: Discussing with the students the meaning and importance of the term reproduction would be a good start for the topic.

Chapter opening exercise: Students should be asked to distinguish between asexual mode of reproduction and sexual mode of reproduction.

Teacher guided discussion

Discuss that the production of new organism from a single parent without the involvement of sex cells is called asexual reproduction as in the case of Amoeba and Hydra. The production of a new

organism from two parents by making use of their sex cells is called sexual reproduction as in the case of humans. Explain that an animal having sperms as sex cells is a male while an animal having ova as sex cells is a female. Sperms and ova are single cells which fuse together during the process of fertilisation to form zygote. Zygote is single celled and has a single nucleus. The fertilisation which takes place inside the female body is called internal fertilisation as in humans while the fertilisation which takes place outside the female body is called external fertilisation as in the case of frogs.

Suggested home assignment

Explain the process of fertilisation of an egg by a sperm to form a zygote with the help of a neat and well-labeled diagram.

ACTIVITIES FOR PERIODS 3 AND 4

Sexual reproduction in humans (Page 104)

Teacher guided discussion

Discuss the male reproductive system and the female reproductive system of humans in detail with the students with the help of resources mentioned below. Explain that during the process of fertilisation, a sperm combines with the egg in the oviduct and fertilizes it to form zygote. Zygote divides repeatedly to form a ball of cells called embryo which then gets embedded in the thick lining of the uterus by a process called implantation. Embryo continues to grow in the uterus at the stage when all the body parts can be identified and is called foetus.

Using resources

- Use a chart showing the male reproductive system in humans.
- Use a chart showing the female reproductive system in humans
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Differentiate among zygote, embryo and foetus.

NEP

Life Skills (Communication): The teacher can conduct a debate competition in the class and ask the students to give their views on the topic-Should sex education be made compulsory in schools or not?

ACTIVITIES FOR PERIOD 5

In-vitro fertilisation (Page 107)

Teacher guided discussion

Explain that the babies born through in vitro fertilisation technique are called test tube babies because the fertilisation takes place in a glass dish or a glass test tube.

Suggested home assignment

How does the in vitro fertilisation help women with blocked oviducts?

NEP

21st Century skills: The teacher can ask the students to gather information from internet and other sources about the assisted reproductive technologies (ART) and the purpose it serve in the society.

ACTIVITIES FOR PERIOD 6

Viviparous animals and oviparous animals (Page 108)

Teacher guided discussion

Discuss with the students that those animals which give birth to young ones are called viviparous animals like humans while the animals which lay eggs from which young ones are hatched later on are called oviparous animals like hen.

Suggested home assignment

Differentiate between viviparous and oviparous animals giving at least three examples.

ACTIVITIES FOR PERIOD 7

The case of hen (Page 109)

Teacher guided discussion

Explain them that the hen is a bird and internal fertilisation takes place resulting in the production of eggs from which chicks are hatched later on.

Suggested home assignment

Describe the development of chick from hen's egg.

ACTIVITIES FOR PERIOD 8

Metamorphosis (Page 110)

Teacher guided discussion

Discuss with the students that the process of transformation from an immature form of an animal like larva to its adult form in two or more distinct stages is called metamorphosis. Discuss the process of metamorphosis in frog and silk moth in detail with the help of resources mentioned below.

Using resources

- Use a chart showing the metamorphosis of tadpole to form a frog.
- Use a chart showing the metamorphosis of caterpillar to form a silk moth.

Suggested home assignment

Make a flow chart describing the metamorphosis of tadpole to form a frog.

ACTIVITIES FOR PERIOD 9 AND 10

Asexual reproduction in animals (Page 111)

Teacher guided discussion

Explain that asexual reproduction is the production of a new organism from a single parent without the involvement of sex cells. In Amoeba, it occurs by a method called binary fission in which the

parent organism splits to form two new organisms. In Hydra, it occurs by a method called budding in which a small part of the body of the parent organism grows out as bud which then detaches and becomes a new organism.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Draw a neat and well-labeled diagram showing:

1. Binary fission in Amoeba.
2. Budding in Hydra.

NEP

Experiential learning through indoor activity: The teacher can show prepared slides of hydra and ask students to carefully observe them and count the number of bulges they see in different slides.

ACTIVITIES FOR PERIOD 11

Cloning (Page 113)

Teacher guided discussion

Explain to the students that cloning is the production of an exact copy of an animal by means of asexual reproduction. The clone is genetically identical to its parent. The cloning in animals is done by the transfer of nucleus of the cell. Explain the cloning of Dolly sheep in detail to students. Tell them the advantages and disadvantages of cloning.

Suggested home assignment

Describe the advantages and disadvantages of cloning of an organism.

ACTIVITIES FOR PERIOD 12

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 13

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 14 AND 15

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- | | |
|----------------------------|-------------------------|
| (a) Reproduction | (b) Sexual reproduction |
| (c) Fertilisation | (d) Gametes |
| (e) Testes and ovaries | (f) Uterus |
| (g) In Vitro Fertilisation | (h) Frog, silk moth |
| (i) Binary fission | (j) Cloning |

2. Fill in the following blanks with suitable words:-

- | | |
|------------------------------|-------------------|
| (a) zygote | (b) fertilisation |
| (c) ovum | (d) smaller |
| (e) month | (f) oviparous |
| (g) viviparous ; oviparous | (h) tadpole |
| (i) binary fission ; budding | |

3. State whether the following statements are true or false :-

- | | | | | |
|-----------|-----------|-----------|-----------|-----------|
| (a) True | (b) False | (c) True | (d) True | (e) True |
| (f) False | (g) False | (h) True | (i) False | (j) False |
| (k) True | (l) False | (m) False | | |

4. Match the terms given in column A with those given in column B :

- | | | | |
|----------|---------|----------|-----------|
| (a) (iv) | (b) (i) | (c) (ii) | (d) (iii) |
|----------|---------|----------|-----------|

Subjective Type Questions

Short Answer Type Questions

1. (a) The basic difference between asexual and sexual reproduction is that only one parent is needed in asexual reproduction whereas two parents are needed in sexual reproduction. Another difference is that no sex cells (or gametes) are involved in asexual reproduction but sex cells (or gametes) take part in sexual reproduction.
(b) Amoeba and hydra reproduce by asexual method while cats, humans and birds reproduce by sexual method.
2. (a) The fertilisation which takes place inside the female body is called internal fertilisation. In internal fertilisation, the female animal's eggs are fertilised by sperms inside her body. For example, a man puts his sperms inside a woman's body. These sperms then fertilise the egg inside the woman's body. The fertilisation which takes place outside the female body is called external fertilisation. In external fertilisation, the female animal's eggs are fertilised by sperms outside her body. For example, the males and females of frogs and fish release their sperms and eggs in water in which they live. The sperms then collide with the eggs and fertilise them outside the body of female frog or fish.

- (b) (i) cow- internal (ii) frog-external (iii) humans-internal (iv) fish-external
(v) hen-internal
3. (a) Refer to Figure 6.
(b) Oviduct
4. Animals like frog (and fish) which undergo external fertilisation, lay hundreds of eggs because all the eggs do not get fertilised and hence do not develop into new frogs (or fishes).
5. 1. A zygote is formed by the fusion of male and female gametes (sperm and egg). An embryo is formed by the repeated cell division of a zygote. A foetus is formed by the growth and development of an embryo.
2. A zygote is the beginning of the formation of a baby. An embryo is an unborn baby in the uterus in the early stages of development (up to 8 weeks). A foetus is an unborn baby in the uterus in the later stages of development (after 8 weeks till birth).
6. The sexual reproduction in animals takes place in the following steps :
(i) The male parent produces male gametes called sperms.
(ii) The female parent produces female gametes called eggs (or ova).
(iii) The sperm enters into the egg. The nucleus of sperm fuses with the nucleus of egg cell to form a new cell called zygote (The zygote is a fertilised egg).
(iv) The zygote divides repeatedly to form a hollow ball of hundreds of cells which is called embryo.
(v) Embryo grows and becomes a foetus (in which all the main body features of the baby animal have formed).
(vi) Foetus grows and develops to form a new baby animal.
7. Refer to Figure 5.
8. The process of transformation from an immature form of an animal like 'larva' to its 'adult form' in two or more distinct stages is called metamorphosis. Metamorphosis occurs in amphibians (like frogs) and insects (such as silk moth, butterfly, housefly and mosquito, etc.). Animals which undergo metamorphosis are butterfly, silk moth, frog, housefly, mosquito while which do not undergo metamorphosis are cow, humans, sparrow, hen and monkey.
9. (a) Those animals which give birth to young ones (or baby animals) are called viviparous animals. Some examples of viviparous animals are: Cow, Dog, Cat, Lion, Tiger, Horse, Rabbit, Rat, Elephant and Camel. Those animals which lay eggs from which young ones (baby animals) are hatched later on, are called oviparous animals. Some examples of oviparous animals are: Sparrow, Crow, Butterfly, Housefly, Frog, Fish, Lizard, Snake, Ostrich, and Crocodile.
(b) Oviparous: frog, sparrow, lizard, hen, fish, butterfly
Viviparous: human being, cow, dog, cat
10. Cloning is the production of an exact copy of an animal by means of asexual reproduction. Gametes are not involved in cloning. Dolly sheep and cows have been produced by cloning.
11. The production of new organisms from the existing organisms of the same species is known as reproduction. Reproduction is essential for the survival of a species on this earth.

Long Answer Type Questions

1. The fusion of a male gamete with a female gamete to form a zygote during sexual reproduction, is called fertilisation. In human beings, the process of fertilisation is the meeting of a sperm cell from the father with an egg cell from the mother to form a fertilised egg cell called zygote. The sperms made in the testes of man are introduced by penis into the woman's body through vagina. The sperms enter into vagina, pass through the uterus and then go into the oviducts. The tails of sperms helps them in moving and reach the oviducts. If at the same time, the ovary of woman releases an egg (or ovum), then this egg also goes into the oviduct. One of the sperms enters the egg. The fusion of sperm with egg is called fertilisation. During fertilisation, the nucleus of sperm fuses with the nucleus of egg cell to form a single nucleus. This result in the formation of a fertilised egg called zygote. Thus, a sperm combines with the egg in the oviduct and fertilises it to form a zygote. The zygote (or fertilised egg) is the beginning of the formation of a new baby (or a new individual). Refer to Figure 3 for the diagram.
2. (a) In vitro fertilisation (IVF) technique is used to help those couples (husbands and wives) in having babies who can produce sperms and eggs but fertilisation cannot take place inside the woman's body due to blocked oviducts (or blocked fallopian tubes).
(b) The *in vitro* fertilisation technique helps the woman with blocked oviducts in having babies as follows :
 1. The eggs are removed from the ovary of woman by laparoscopy. In this operation, a small cut is made in the side of woman's abdomen and an optical fibre tube is inserted into her body so that the doctor can see the ovary and take out the tiny eggs.
 2. The woman's husband provides the sperms (in the form of semen).
 3. The sperms are mixed with eggs in a glass dish (or glass test-tube) to carry out fertilisation. The fertilised eggs (or zygotes) develop into embryos.
 4. After about a week, one or more embryos are placed in the woman's uterus (or womb). If the embryo gets implanted in the uterus successfully, then normal pregnancy occurs and a baby is born after about nine months.
3. (a) Those animals which give birth to young ones (or baby animals) are called viviparous animals. In viviparous animals, the young one develops in the uterus inside the body of the mother (female parent). When the young one is fully developed, then the mother gives birth due to which the alive young one (or baby animal) comes out from the body of the mother. Some examples of viviparous animals are: Cow and Camel. In fact, all the mammals are viviparous animals.
(b) Those animals which lay eggs from which young ones (baby animals) are hatched later on, are called oviparous animals. In oviparous animals, the mother (female parent) lays eggs outside its body. The young one of the animal develops inside the egg. When the development of the young one inside the egg is complete, the egg shell breaks open and an alive young one (baby animal) comes out of it. Some examples of oviparous animals are: Sparrow and Crocodile.
4. The unicellular organism (or unicellular animal). Amoeba reproduces by binary fission by dividing its body into two parts. When the Amoeba cell has reached its maximum size of growth, then first the nucleus of Amoeba lengthens and divides into two parts. After that

the cytoplasm of Amoeba divides into two parts, one part around each nucleus. In this way, one parent Amoeba divides to form two smaller Amoebae (called daughter Amoebae). And we say that one Amoeba produces two Amoebae. Amoeba takes about an hour to divide into two daughter Amoebae. The two daughter Amoebae produced here grow to their full size by eating food and then divide again to produce four Amoebae, and so on. The daughter Amoebae produced by the process of binary fission are identical to the parent Amoeba. Refer to Figure 16 for diagram.

5. Hydra is a simple multicellular animal. It reproduces by the process of budding. In Hydra, first a small outgrowth called 'bud' is formed on the side of its body by the repeated divisions of its cells. This bud then grows gradually to form a small Hydra by developing a mouth and tentacles. And finally the tiny new Hydra detaches itself from the body of parent Hydra and lives as a separate organism. In this way, the parent Hydra has produced (or created) a new Hydra. Thus, Hydra reproduces asexually by growing buds from its body. This is called budding. The bud formed in a Hydra is not a single cell. It is a group of cells. In the tiny animal called Hydra, new Hydreae develop from the buds. This method of asexual reproduction in Hydra is called budding. Refer to Figure 17 for diagram.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (a) | 2. (b) | 3. (a) | 4. (b) | 5. (d) |
| 6. (d) | 7. (c) | 8. (d) | 9. (c) | 10. (b) |
| 11. (c) | 12. (c) | | | |

Case Based Questions

1. Fallopian tubes of Latika are blocked.
2. (a) In-vitro fertilisation (IVF)
(b) The babies produced by in vitro fertilisation are called test tube babies.
3. Zygote is formed outside the body of female in this process.

Assertion-Reason Based Questions

1. (b) A and R both are correct but R is not the correct explanation of A.
2. (b) A and R both are correct but R is not the correct explanation of A.
3. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.
4. (d) A is incorrect but R is correct.



21st Century Skills

1. (a) Yeast (b) Fermentation (c) Fungi (d) Hydra
(e) Multicellular : Y (Hydra) ; Unicellular : X (Yeast)
2. P : Amoeba ; Q : Pseudopodia ; R : Binary fission ; S : Paramecium
3. (a) (i) Frog (ii) Tadpole (b) Metamorphosis (c) Lungs and Skin (d) Gills
4. (a) A : Mosquito ; B : Larva ; C : Metamorphosis ; D : Plasmodium (b) Butterfly

WORKSHEET– CLASS 8, CHAP. 6 REPRODUCTION IN ANIMALS

Name: Class: Date:

A. Objective Type Questions

- 1. The characteristics which are transmitted from parents to offsprings during sexual reproduction show:**
(a) Only similarities with parents
(b) Both similarities and variations with parents
(c) Only variations with parents
(d) None of the above
- 2. In human males, the testes lie in the scrotal sacs outside the body because it helps in:**
(a) Process of mating
(b) Formation of sperms
(c) Easy transfer of sperms
(d) All of these
- 3. Identify which of the following is not a part of the human reproductive system:**
(a) Ovary
(b) Uterus
(c) Scrotal sacs
(d) Oviducts
- 4. The production of exact copy of an animal by asexual reproduction is called:**
(a) Hatching
(b) Cloning
(c) Mating
(d) Budding
- 5. is not an oviparous animal:**
(a) Snake
(b) Fish
(c) Rat
(d) Frog
- 6. Identify the animal that does not show metamorphosis:**
(a) Silk moth
(b) Mosquito
(c) Frog
(d) Fish
- 7. Identify the animal that is not viviparous:**
(a) Cat
(b) Rat
(c) Lizard
(d) Rabbit
- 8. Fertilization results in the immediate formation of:**
(a) Zygote
(b) Embryo
(c) Placenta
(d) Foetus
- 9. A tadpole develops into an adult frog by the process of:**
(a) Metamorphosis
(b) Embedding
(c) Budding
(d) Fertilization
- 10. Internal fertilization occurs:**
(a) In female body
(b) Outside female body
(c) In male body
(d) Outside male body

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) Dolly, the sheep, was produced by the technique of
 - (b) The larva of a frog is called
 - (c) The egg laying animals are called
 - (d) The other name of egg cell is
 - (e) The process of fusion of gametes is called

2. Name the following:

- (a) The other name of sex cells.
 - (b) The organs which produce sperms in humans.
 - (c) The female reproductive organ where the embryo gets embedded.
 - (d) The female gametes in humans.
 - (e) The type of fertilisation that takes place in hen.

B. Short Answer Type Questions

1. What is the full form of IVF? What is its success rate?
 2. What does the following produce?
 - (a) Testes in a man
 - (b) Ovary in a woman
 3. In which female reproductive organ does the embryo get embedded?
 4. Which stage comes earlier in the development of a human baby from zygote: foetus or embryo?
 5. Differentiate between:
 - (a) Zygote, embryo and foetus.
 - (b) Internal fertilization and external fertilization
 6. After how many weeks of development, a human embryo is said to become a foetus?
 7. What are gametes? In which type of reproduction are they involved? What is formed when two gametes fuse? What is this act of fusion called?
 8. What do you understand by the term cloning? Are gametes involved in cloning? Name two clones.
 9. Define asexual reproduction. Name two methods of asexual reproduction and name two animals which are produced by the methods you have mentioned.

7

Reaching the Age of Adolescence

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Elucidate the meaning of the term adolescence.
- Define the term puberty and recognize the changes that take place during puberty.
- List the secondary sexual characteristics in human beings.
- Define hormones and explain their role in initiating reproductive functions.
- Explain about the reproductive phase of life in humans.
- Illustrate how the sex of a baby is determined.
- Identify the functions of hormones other than sex hormones in humans.

Textbook: Refer to pages 120 to 141

Periods allocated: 16 periods

VOCABULARY

Child, adult, adolescence, adolescent, puberty, hormones, pimples, acne, sebaceous glands, sweat glands, sweat, exocrine glands, endocrine glands, testosterone, estrogen, menstruation, menopause, ovulation, menstrual cycle, drugs, goitre, adrenaline, insulin.

ACTIVITIES FOR PERIOD 1 AND 2

Adolescence (Page 120)

Learning Tools

Interactive warm up exercise: Discussing the physical changes students observe in their bodies during this age would be a good start for the topic.

Chapter opening exercise: Students should be asked the myths and taboos regarding reproduction. That would create awareness about the topic to be studied.

Teacher guided discussion

Discuss with the students that the transitional period of physical and mental development which occurs between childhood and adulthood is called adolescence and the person who is in progress of growing from a child to an adult is called an adolescent.

Suggested home assignment

Define adolescence.

NEP

Art Integration: The teacher can ask the students to paste their photos in manner depicting the transition of growth since their childhood to their present age in their scrapbook. Also ask them to recognize the changes they see.

ACTIVITIES FOR PERIOD 3 AND 4

Puberty and changes at puberty (Page 121)

Teacher guided discussion

Discuss with the students that the period during which adolescent boys and girls reach sexual maturity and become capable of reproduction is called puberty. It starts earlier in girls than in boys. Students should be familiarized with the various changes which occur in boys and girls. Discuss changes like increase in height, changes in shape and appearance, change in voice, development of pimples and acne on face, development of sex organs and reaching mental, intellectual and emotional maturity.

Suggested home assignment

What are the general changes observed during puberty in boys and girls?

ACTIVITIES FOR PERIOD 5 AND 6

Secondary sexual characteristics in humans (Page 126)

Teacher guided discussion

Explain them that the sexual characteristics which are present at birth are called primary sexual characteristics. The secondary sexual characteristics controlled by hormones which distinguish between sexually mature males and females but are not directly involved in reproduction are called secondary sexual characteristics. Discuss the main secondary sexual characteristics in males and females.

Suggested home assignment

Mention main secondary sexual characteristics of males and females.

ACTIVITIES FOR PERIOD 7

Hormones and role of hormones in initiating reproductive functions (Page 127)

Teacher guided discussion

Discuss that hormones are the chemical substances which coordinate the activities of living organisms, and also their growth. Discuss the difference between exocrine glands and endocrine glands. Explain them that the onset of puberty is controlled by hormones. The testes make the male sex hormone called testosterone. The ovaries make the female sex hormone called estrogen. The production of these sex hormones is under the control of gonadotrophic hormone secreted by the pituitary gland. Students should know the functions of sex hormones.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Mention the function of testosterone in males and estrogen in females.

ACTIVITIES FOR PERIOD 8

Reproductive phase of life in humans (Page 128)

Teacher guided discussion

Discuss that in men, the capacity to produce male gametes usually lasts throughout life. In females, the reproductive phase of life begins at puberty (10-12 years of age) and generally lasts till the age of 45-50 years. Explain that the bleeding from the uterus which occurs in a woman every month if the egg cell has not been fertilized is called menstruation. It occurs after every 28-30 days because of ovulation. The first occurrence of menstruation at puberty is called menarche. The permanent stoppage of menstruation in a woman is called menopause. The process of ovulation and menstruation in women is called menstrual cycle.

Suggested home assignment

What is menstrual cycle?

ACTIVITIES FOR PERIOD 9

How is the sex of a baby determined (Page 130)

Teacher guided discussion

Explain them that the two chromosomes that determine the sex of a baby are called sex chromosomes. A female has only X chromosomes in her gametes while a male has both X and Y chromosomes in his gametes. It is the sperm of the man which determines the sex of the child.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Which sex chromosomes are present in a male and in a female?

ACTIVITIES FOR PERIOD 10

Myths and taboos regarding reproduction (Page 131)

Teacher guided discussion

Explain to the students that a widely held but false belief is known as a myth and something prohibited by social customs is called a taboo. Discuss the important myths and taboos regarding reproduction with students. Clear their beliefs and sensitise them with the fact that a girl is no less than a boy. They should also be sensitised about the problems brought about by early marriage in girls leading to early motherhood.

Suggested home assignment

List the problems brought about by early marriage in girls leading to early motherhood.

NEP

21st Century skills: The teacher can ask the students to explore internet and recognise the role played by NGO's like Sarthi Trust, etc to stop child marriage and generating hope of education for young boys and girls in India.

ACTIVITIES FOR PERIOD 11

Reproductive health (Page 132)

Teacher guided discussion

Explain that reproductive health is defined as a state of physical, mental and social well being of a person in all matters relating to the reproductive system at all stages of life. Discuss the nutritional needs of adolescents, their personal hygiene, physical exercise, harmful effects of taking drugs and AIDS as a sexually transmitted disease.

Suggested home assignment

Give the full form of AIDS and HIV.

NEP

Local Knowledge: The teacher can ask the students to list the names of food items they have in their breakfast, lunch, and dinner at home and identify the items that are useful for maintaining good health and proper growth.

ACTIVITIES FOR PERIOD 12

Hormones other than sex hormones (Page 135)

Teacher guided discussion

Discuss with the students the location, name of hormone produced and function of some of the important glands other than those which produce sex hormones. These are pituitary gland, thyroid gland, pancreas and adrenal glands.

Suggested home assignment

Name the hormone produced by pituitary gland, thyroid gland, pancreas and adrenal glands.

ACTIVITIES FOR PERIOD 13

Role of hormones in completing the life history of frogs and insects (Page 136)

Teacher guided discussion

Explain that all the amphibians like frog need thyroxine to undergo metamorphosis and change from larvae to adults. In insects like the silk moth, metamorphosis is controlled by insect hormone.

Suggested home assignment

Name the hormone which controls the metamorphosis in the case of frogs.

ACTIVITIES FOR PERIOD 14

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 15

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 16

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- | | |
|-----------------|------------------------|
| (a) Adolescence | (b) Larynx |
| (c) Oil | (d) Testes and ovaries |

- | | |
|---------------------|---|
| (e) Pituitary gland | (f) Menstruation |
| (g) Mother's milk | |
| (h) | (i) Acquired Immune Deficiency Syndrome |
| | (ii) Human Immunodeficiency Virus |
| (i) HIV | (j) Pituitary gland |
| (k) Iodine | (l) Thyroxine |
| (m) Pancreas | (n) Diabetes |
| (o) Adrenaline | (p) Adrenal glands |
| (q) Thyroxine | (r) Insect hormone |

2. Fill in the following blanks with suitable words :-

- | | |
|-------------------------|--------------------|
| (a) puberty | (b) hormones |
| (c) faster | (d) growing |
| (e) secondary | (f) hormones |
| (g) hormones | (h) 23 ; 1 |
| (i) sex | (j) mother ; child |
| (k) fruits ; vegetables | (l) pituitary |
| (m) thyroxine | |

3. State whether the following statements are true or false :-

- | | | | |
|-----------|-----------|-----------|----------|
| (a) False | (b) False | (c) True | (d) True |
| (e) False | (f) False | (g) False | |

Subjective Type Questions

Short Answer Type Questions

1. The transitional period of physical and mental development which occurs between childhood and adulthood is called adolescence. Some of the changes which take place in boys during adolescence are: Facial and body hair growth; voice deepens; and testes start to make sperms. And some of the changes which take place in girls during adolescence are: Breasts grow; ovaries start to release eggs (or ova); and menstruation (monthly periods) begin.
2. The bulge (or projection) at the front of throat or neck in grown up boys is called Adam's apple. Adam's apple is formed in grown up boys because of their bigger voice box in the throat.
3. (a) At puberty, the male sex organs like testes and penis enlarge and develop completely. At puberty, the female sex organs like ovaries, oviducts and uterus enlarge and develop completely.
(b) The pimples and acne are formed due to the increased activity of sebaceous glands and sweat glands present in the skin.
4. (a) In boys: (i) Hair grow on face (in the form of moustache and beard) in boys. (ii) Shoulders and chest broaden (become wider) in boys. In girls: (i) Development of breasts in girls. (ii) Hips broaden and become more curved and prominent in girls.

- (b) Moustache, broad hips, beard, breasts, Adam's apple, wide shoulders, deeper voice are secondary sexual characteristics.
5. Thyroid gland, pituitary gland, adrenal gland.
6. (a) Girl b. Boy
7. Hormones are the chemical substances which co-ordinate the activities of living organisms (including human beings), and also their growth. Hormones are made and secreted by specialised tissues in the body called 'endocrine glands'.
8. (i) The first occurrence of menstruation (or periods) at puberty is called menarche. ii. The permanent stoppage of menstruation (or periods) in a woman is called menopause. The bleeding from the uterus which occurs in a woman (or mature girl) every month (if the egg cell has not been fertilised) is called menstrual flow or menstruation.
9. One of the hormones secreted by pituitary gland is the growth hormone (or human growth hormone). The growth hormone controls the growth of the human body (like the growth of bones and muscles).
10. The function of insulin hormone is to lower the blood sugar level (or blood glucose level). Pancreas secretes the hormone called insulin.
11. (i) Pituitary gland is attached to the base of the brain.
(ii) Thyroid is a large endocrine gland in the neck. It is attached to the wind pipe in our body.
(iii) Pancreas is just below the stomach in our body.
(iv) There are two adrenal glands in our body which are located on the top of two kidneys.
12. The production of thyroxine hormone requires the presence of iodine in water. So, if the pond water in which the tadpoles are growing does not contain sufficient iodine to make enough thyroxine hormone, there will be deficiency of thyroxine hormone due to which tadpoles cannot undergo metamorphosis and hence cannot become adult frogs.
13. (a) Sugar and jaggery (*gud*) contain carbohydrates that give us energy. (b) sunflower oil and coconut oil. (c) milk and groundnuts (d) fruits and vegetables.
14. Adolescent boys and girls should take bath regularly (at least once everyday). Adolescent girls should take special care of cleanliness of the body during the time of menstrual flow (or periods).

Long Answer Type Questions

1. (a) The various changes which occur in boys during puberty are as follows:
- (i) Hair grow on the face of boys (in the form of moustache and beard), and on chest.
 - (ii) Voice deepens in boys. It becomes low pitched voice.
 - (iii) Testes start to make sperms.
 - (iv) Testes and penis become larger.
 - (v) Chest and shoulders of boys broaden (become wider).
 - (vi) Body becomes muscular (due to development of muscles).

- (vii) Hair grows in armpits and in pubic regions (genital area) between the thighs.
 - (viii) Rapid increase in height occurs.
 - (ix) Feelings and sexual drives associated with adulthood begin to develop.
- (b) The various changes which occur in girls during puberty are as follows:
- (i) Breasts develop and enlarge in girls.
 - (ii) Ovaries start to release eggs (or ova).
 - (iii) Menstruation (monthly periods) begin.
 - (iv) Ovaries, oviducts, uterus and vagina enlarge.
 - (v) Hips of girls broaden (become wider). Extra fat is deposited on hips and thighs.
 - (vi) Hair grow in armpits and in pubic regions (genital area) between the thighs (*This change is the same as in boys*).
 - (vii) Rapid increase in height occurs (*This change is the same as in boys*).
 - (viii) Feelings and sexual drives associated with adulthood begin to develop (*This change is also the same as in boys*).
2. (a) The sexual characteristics which are present at birth are called primary sexual characteristics. Primary sexual characteristics include internal and external sex organs which are present in babies at the time of their birth. The primary sexual characteristics in males (or boys) are : Testes, Penis and Seminal vesicles, etc. The primary sexual characteristics in females (or girls) are : Ovaries, Oviducts, Uterus and Vagina, etc. The primary sexual characteristics are directly involved in reproduction.
- (b) The sexual characteristics controlled by hormones which distinguish between sexually mature males and females (sexually mature boys and girls) but are not directly involved in reproduction, are called secondary sexual characteristics. In secondary sexual characteristics, the body parts (other than sex organs) develop special features which make it easier to distinguish a boy from a girl. For example, the growth of facial hair (like moustache and beard) in boys is a secondary sexual characteristic which helps to distinguish between a mature boy and a girl (because facial hairs do not grow in girls). Similarly, the development of breasts in girls is a secondary sexual characteristic which helps to distinguish a girl from a boy (because boys do not develop breasts). The secondary sexual characteristics start developing at the time of puberty and continue to develop through the period of adolescence.
3. The process of ovulation and menstruation in women is called menstrual cycle (because it occurs again and again after a fixed time period). The menstrual cycle is a period of about 28 to 30 days during which an egg cell (or ovum) matures, the mature egg cell is released by the ovary, thickening of uterus lining takes place, and finally the uterus lining breaks down causing bleeding in women (if the egg cell has not been fertilised). Initially, the menstrual cycle in girls may be irregular (it may not be of 28 to 30 days). It becomes regular after some time. Menstrual cycle in women is controlled by hormones.
4. (a) According to the World Health Organisation (WHO), reproductive health is defined as a state of physical, mental and social well-being of a person in all matters relating to the reproductive system at all stages of life.

- (b) Some of the important conditions to maintain good reproductive health during adolescence are given below:
- (i) It is necessary to eat balanced diet during adolescence.
 - (ii) It is necessary to maintain personal hygiene during adolescence.
 - (iii) It is necessary to take adequate physical exercise during adolescence.
 - (iv) It is necessary to avoid taking any drugs during adolescence.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (a) | 2. (b) | 3. (c) | 4. (a) | 5. (d) |
| 6. (b) | 7. (d) | 8. (c) | 9. (b) | 10. (b) |
| 11. (d) | 12. (d) | | | |

Case Based Questions

1. Iodine
2. Deficiency of thyroxine hormone causes goitre.
3. Iodised salt provides iodine needed by thyroid gland to make thyroxine hormone.

Assertion-Reason Based Questions

1. (b) A and R both are correct but R is not the correct explanation of Ad
2. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.
3. (c) Tadpoles cannot become adult frogs in absence of iodine because the process of metamorphosis requires thyroxine hormone.
4. (d) A is incorrect but R is correct.



21st Century Skills

1. (a) (i) Menstruation (ii) Periods (b) Puberty (c) That the reproductive system of human female has started working (d) Beginning of pregnancy (e) Menopause
2. (a) The oviducts of woman are blocked (due to which the ovum released by her ovary cannot meet the sperm and get fertilised) (b) *In Vitro Fertilisation* (IVF)
3. W : Pancreas ; X : Insulin ; Y : Diabetes ; Z : Diabetic
4. (a) (i) Iodine (ii) Thyroxine (iii) Metamorphosis (b) Goitre

WORKSHEET– CLASS 8, CHAP. 7 REACHING THE AGE OF ADOLESCENCE

Name: Class: Date:

A. Objective Type Questions

1. The right meal for adolescents consists of:

- | | |
|------------------------------|--|
| (a) Chips, noodles, coke | (b) Chapati, dal, vegetables |
| (c) Rice, noodles and burger | (d) Vegetable cutlets, chips and lemon drink |

2. AIDS disease is caused by:

- | | |
|--------------|--------------|
| (a) Bacteria | (b) Virus |
| (c) Worms | (d) Protozoa |

3. Which of the following endocrine glands does not occur as a pair in the human body?

- | | |
|-------------|---------------|
| (a) Adrenal | (b) Pituitary |
| (c) Testis | (d) Ovary |

4. Which of the following can lead to menstruation in a 22 year old woman during ovulation?

- | | |
|--|-------------------------|
| (i) Sperms available for fertilization | (ii) Oviducts blocked |
| (iii) Sperms not available for fertilization | (iv) Oviducts not block |

The correct answer is:

- | | |
|--------------------|-------------------|
| (a) (i) and (ii) | (b) (i) and (iii) |
| (c) (ii) and (iii) | (d) (ii) and (iv) |

5. A doctor advised a person to take injection of insulin because:

- | | |
|---------------------------------|---|
| (a) His blood pressure was high | (b) His heart beat was high |
| (c) His blood sugar was high | (d) His thyroxine level in blood was high |

6. The time between childhood and adulthood:

- | | |
|----------------|-------------|
| (a) Toddler | (b) Puberty |
| (c) Adolescent | (d) Baby |

7. Which among the following is an exocrine gland?

- | | |
|---------------|-------------|
| (a) Pituitary | (b) Adrenal |
| (c) Sweat | (d) Thyroid |

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- Metamorphosis in amphibians is brought about by hormone.
- The protective foods are and
- X and Y chromosomes are called chromosomes.
- Menstrual cycle in women is controlled by
- The onset of puberty is controlled by

2. Name the following:

- The period of life between childhood and adulthood.
- The other name of voice box.
- The other name of ductless glands.
- The term used for secretions of endocrine glands.
- Substance secreted by sebaceous glands.

B. Short Answer Type Questions

- How do shoulders and chest change in boys and hips of girls change during puberty?
- What substance is secreted by sebaceous glands?
- Name two glands present in the skin whose increased activity causes pimples and acne.
- Name any two glands which function as endocrine glands as well as exocrine glands.
- Name: (a) female sex hormone, and (b) male sex hormone.
- Name the hormone which develops secondary sexual characteristics:
 - In females (girls)
 - In males (boys)
- State the function of male sex hormone ‘testosterone’.
- Name the endocrine gland which controls the production of sex hormones ‘testosterone’ and ‘estrogen’.
- What is the name of the process in which the thickened uterus lining along with its blood vessels is removed from the body of a woman through vaginal bleeding?

8

Force and Pressure

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Define force and identify its characteristics.
- List the effects of force.
- Name and explain the different types of forces.
- Define the term pressure and know more about pressure due to solids, liquids and gases.
- Demonstrate the existence of atmospheric pressure and list its applications in everyday life.

Textbook: Refer to pages 142 to 169

Periods allocated: 16 periods

VOCABULARY

Force, contact force, friction, non-contact force, pressure, atmospheric pressure.

ACTIVITIES FOR PERIODS 1 AND 2

Force- A push or a pull (Page 143)

Learning Tools

Interactive warm up exercise: Discussing with the students the meaning of the terms- 'push' and 'pull' would be a good start for the topic. Ask the students about the situations in everyday life when they use force.

Chapter opening exercise: Students should be asked to push their copy on the table. Further ask them which two things interacted to move the copy from its original place.

Teacher guided discussion

Discuss that a push or pull on an object is called force. It is due to an interaction between two objects, has magnitude and direction. Students should be able to comprehend the cases that arise when two forces act on an object.

Suggested home assignment

What happens when force acts in the same direction and when force acts in opposite directions?

NEP

Experiential learning through outdoor activity: The teacher can take the students to school playground and ask them to work in pairs.

One student of each pair is given a ball and is asked push it.

The other student of the pair is asked to place a stick in ball's path.

Ask the students to repeat the activity by placing the stick at different angles to obstruct the moving ball.

Then ask them to identify the cause for change in direction of the moving ball.

Also ask them to compare the magnitude of force required for the stick placed at different angles to stop the ball.

ACTIVITIES FOR PERIOD 3

Effects of force (Page 145)

Teacher guided discussion

Discuss with them that a force can produce many effects like moving a stationary object, stop a moving object, and change the speed, direction and shape of the object. Students should be able to give examples of all these effects produced by a force.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Explain with the help of an example how force can change the direction of a moving object.

ACTIVITIES FOR PERIOD 4

Contact forces (Page 148)

Teacher guided discussion

Explain to the students that a force which can be exerted by an object on another object only through 'physical touching' is called contact force. It is of two types: Muscular force and Frictional force. Students should be able to explain why these forces are called contact forces by giving examples.

Suggested home assignment

What are contact forces? Give two examples of contact forces.

ACTIVITIES FOR PERIOD 5 AND 6

Non-contact forces (Page 149)

Teacher guided discussion

Discuss that a force which can be exerted by an object on another object even from a distance without touching is called a non-contact force. It is of three types: Magnetic force, Electrostatic force and Gravitational force. Explain these three forces in detail to the students.

Using resources

Conduct the activity given on page no. 150 to show the magnetic force of attraction as well as repulsion between two bar magnets.

Suggested home assignment

Who gave the idea of gravitational force and how?

NEP

Experiential learning through indoor activity: The teacher can ask the students to suspend one plastic straw along the edge of a table using a thread. Also ask them to bring another straw rubbed with a sheet of paper near that straw and observe what happens.

ACTIVITIES FOR PERIOD 7

Pressure (Page 153)

Teacher guided discussion

Explain them that pressure is produced when a force acts on an object. It is the force acting per unit area of the object. It is expressed in Pascal. Students should know that it depends on two factors: Force applies and area over which the force acts. They should be able to comprehend why school bags have wide straps, why a sharp knife cuts better than a blunt knife, why the tip of the needle is sharp and why the depression is much more when a man stands on the cushion than when he lies down on it.

Suggested home assignment

Explain why your school bag has wide straps.

ACTIVITIES FOR PERIODS 8 TO 10

Pressure exerted by liquids (Page 156)

Teacher guided discussion

Explain to the students that all liquids exert pressure on the bottom and the walls of the containers. The pressure exerted by a liquid increases with increasing depth inside the liquid. Students can be

made to understand that liquids exert pressure on the bottom and walls of the container as well as it exerts equal pressure at the same depth, by doing the below mentioned activities.

Using resources

- Conduct the activity given on page no. 157 to show that a liquid exerts pressure on the bottom of a container.
- Conduct the activity given on page no. 158 to show that a liquid exerts pressure on the walls of its container.
- Conduct the activity given on page no. 159 to show that a liquid exerts equal pressure at the same depth.

Suggested home assignment

Write an activity to show that the pressure on a liquid increases with depth.

ACTIVITIES FOR PERIOD 11

Pressure exerted by gases (Page 160)

Teacher guided discussion

Explain that all gases exert pressure on the walls of their containers. Air pressure arises due to constant collisions of tiny molecules of the gases present in air with the walls of the container in which it is enclosed. Students should be able to give examples of cases where gases exert pressure.

Suggested home assignment

Give two examples where air exerts pressure.

ACTIVITIES FOR PERIODS 12 AND 13

Atmospheric pressure (Page 160)

Teacher guided discussion

Explain to the students that the layer of air above the earth is called atmosphere and the weight it exerts on the surface of earth and on all the objects on the earth is called atmospheric pressure. It is maximum at the sea level and is low at high mountains. Explain the Magdeburg hemispheres experiment for large atmospheric pressure to make the topic interesting. Students should know that even when the atmospheric pressure is so great, why it does not crush our body. Discuss the applications of atmospheric pressure in our daily life like the working of drinking straw, syringe, dropper and rubber sucker.

Using resources

- Conduct the activity given on page no. 161 to show the existence of atmospheric pressure.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Mention the applications of atmospheric pressure in our daily life.

NEP

Life Skills (Communication): The teacher can ask the students to name some devices used at their home that works on atmospheric pressure.

ACTIVITIES FOR PERIOD 14

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 15

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 16

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- | | |
|-------------------------------|---------------------------|
| (a) Force | (b) Force |
| (c) Gravitational force | (d) Newton |
| (e) Two contact forces are :- | |
| (i) Muscular force | (ii) Frictional Force |
| Two non-contact forces are :- | |
| (i) Magnetic force | (ii) Electrostatic force. |
| (f) Electrostatic force | (g) Magnetic force |
| (h) Frictional force | (i) Pressure |
| (j) Blood | |

2. Fill in the following blanks with suitable words:-

- | | | |
|-----------------|-----------------|-----------------|
| (a) pull | (b) zero | (c) push ; pull |
| (d) direction | (e) interaction | (f) attracts |
| (g) repels | (h) pressure | (i) increases |
| (j) atmospheric | (k) decreases | |

3. State whether the following statements are true or false :-

- | | | | | |
|-----------|-----------|----------|-----------|-----------|
| (a) False | (b) False | (c) True | (d) False | (e) False |
| (f) True | | | | |

Subjective Type Questions

Short Answer Type Questions

the porters increase the area of contact of the load with their head. Since the load now falls on a larger area of head, the pressure on head is reduced and it becomes easier to carry the heavy load.

10. The magnetic strips help to keep the refrigerator door closed tightly.

Long Answer Type Questions

1. (a) A force which can be exerted by an object on another object only through ‘physical touching’ is called a contact force. Suppose a book is lying on a table. To lift this book from the table, some force is required. When we lift this book from the table by hand, the force is exerted by the muscles of our arm. Similarly, when we kick a football, the force is exerted by the muscles of our leg.
(b) A force which can be exerted by an object on another object even from a distance (without touching each other) is called a non-contact force. A magnet attracts things made of iron (or steel). So, if we bring a magnet near iron nails or pins, the magnet pulls them towards it. Since the iron nails and pins move towards the magnet, it means that the magnet exerts a force on them.
2. (a) The force which always opposes the motion of one body over another body is called frictional force (or friction).
(b) Because frictional force acts between the two surfaces which are in contact with each other.
(c) The magnetic force acts even from a distance. The magnet exerts a magnetic force on objects made of iron, steel, nickel and cobalt.
3. (a) Pressure is produced when a force acts on an object. The effect of a force depends on the area of the object on which it acts. Pressure is the force acting on a unit area of the object. The SI unit of measuring pressure is ‘Newton per square metre’ (N/m^2) which is also called Pascal (Pa).
(b) A school bag (or shoulder bag) has wide strap made of thick cloth (canvas) so that the weight of bag may fall over a large area of the shoulder of the child producing less pressure on the shoulder. And due to less pressure, it is more comfortable to carry the heavy school bag.
4. (a) Atmospheric pressure is the air pressure which is exerted by the weight of air present in the atmosphere. In other words, atmospheric pressure is due to the weight of air present in the atmosphere above us.
(b) A liquid called ‘blood’ flows through blood vessels into each and every cell of our body. Our blood itself exerts a pressure called ‘blood pressure’ which is slightly greater than the atmospheric pressure. Since the atmospheric pressure acting on our body from outside is balanced by the blood pressure acting from inside, we do not get crushed. Actually, the atmospheric pressure is so finely balanced by our blood pressure that we do not feel any discomfort. We even do not feel the existence of atmospheric pressure at all.
(c) As we go up in the atmosphere from the surface of earth, the atmospheric pressure goes on decreasing. This is because as we go up in the atmosphere, the weight of air above us goes on decreasing (due to which the pressure also goes on decreasing).

5. (a) The pressure in a liquid is not the same at all depths. The pressure exerted by a liquid changes with depth in the liquid. Actually, the pressure exerted by a liquid increases with increasing depth inside the liquid. The pressure exerted by a liquid is small just under the surface of the liquid. But as we go deeper in a liquid, the pressure of liquid increases. Actually, as the depth of liquid increases, the weight of liquid column pushing down from above increases, and hence the pressure also increases. Refer to figure 25.
- (b) The wall of a dam is made thicker at the bottom (than at the top) so as to tolerate very high sideways pressure exerted by deep water stored in the reservoir of dam.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|---------|---------|---------|
| 1. (b) | 2. (b) | 3. (d) | 4. (c) | 5. (c) |
| 6. (c) | 7. (c) | 8. (c) | 9. (d) | 10. (c) |
| 11. (d) | 12. (a) | 13. (c) | 14. (d) | 15. (c) |

Case Based Questions

1. Sonia's choice is correct.
2. We know that pressure is inversely proportional to area. The contact area of high heels is lesser than flat shoes. In high heels pressure experienced by Simran would be larger in comparison to flat shoes. So, she would not be able to walk comfortably on sand.
3. Sharp knife cuts better than blunt knife because area of contact is lesser in sharp knife and hence pressure is greater than that of blunt knife. Hence, it cuts better than blunt knife. (Students can give their own answers also.)

Assertion-Reason Based Questions

1. (c) A porter places a thick round cloth on his head before carrying luggage because thick round cloth increases area of contact on head and decreases pressure.
2. (a) Gravitational force is a non-contact force because it acts on objects from a distance even when they are not in physical contact.
3. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.
4. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.



21st Century Skills

1. Pressure exerted by water increases with increasing depth.
2. Upward force applied by the rocket engine and Downward gravitational force applied by the earth.
3. Water exerts pressure on the bottom of the bucket as well as on the sides of the bucket.
4. Upward muscular force applied by hand and Downward gravitational force applied by earth; The two forces being equal and opposite balance each other and hence do not bring a change in the state of motion.

WORKSHEET– CLASS 8, CHAP. 8 FORCE AND PRESSURE

Name: Class: Date:

A. Objective Type Questions

1. Which of the following is not an example of muscular force?
 - (a) A porter carrying a load on a wheel-barrow.
 - (b) An apple falling from a tree.
 - (c) A child riding a bicycle.
 - (d) A person drawing water from a well.
 2. When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to:
 - (a) Pressure of water
 - (b) Gravity of the earth
 - (c) Shape of rubber bulb
 - (d) Atmospheric pressure
 3. If we release a magnet held in our hand, it falls to the ground. The force responsible for this is:
 - (a) Muscular force
 - (b) Magnetic force
 - (c) Electrostatic force
 - (d) Gravitational force
 4. The magnitude of force is expressed in the unit of force called:
 - (a) Pascal
 - (b) Kelvin
 - (c) Newton
 - (d) Magdeburg
 5. The magnitude of atmospheric pressure is equal to the pressure exerted by a:
 - (a) 76 mm tall column of mercury
 - (b) 760 mm tall column of alcohol
 - (c) 76 cm tall column of mercury
 - (d) 760 cm tall column of mercury
 6. When a force of 5 N acts on a surface, it produces a pressure of 500 Pa. The area of surface then must be:
 - (a) 10cm^2
 - (b) 50cm^2
 - (c) 100cm^2
 - (d) 0.01cm^2

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) Force could be a or
- (b) Atmospheric pressure with increasing height.
- (c) The pressure exerted by a liquid with depth.
- (d) A drinking straw shows the existence of pressure.
- (e) A force arises due to between two objects.

2. Name the following:

- (a) The unit of force.
- (b) A non-contact force.
- (c) Force which is used to gather iron pins scattered on the floor.
- (d) The force which stops the rolling ball on its own.
- (e) Force acting on an unit area of the object.

B. Short Answer Type Questions

1. Differentiate between: contact forces and non-contact forces.
2. Which force can be used to gather iron pins scattered on the floor?
3. An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for attraction between the balloon and the wall?
4. What conclusion do you get from the observation that a fountain of water is created at the leaking joint of pipes of the main water supply line?
5. What substance present in our body balances the atmospheric pressure acting on us?
6. What type of pressure is involved in the filling of a liquid in a syringe?
7. What makes a balloon get inflated when air is filled in it?
8. Where is the pressure greater, 10 m below the surface of the sea or 20m below the surface of sea?
9. What force acting on an area of 0.5m^2 will produce a pressure of 500 Pa?
10. Define ‘state of motion’ of an object. Name the ‘agent’ which can change the state of motion of the object.

9

Friction

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Define the term friction and identify what causes it.
- List the factors affecting friction.
- Demonstrate how to compare static friction with rolling and sliding friction.
- Recognise the advantages and disadvantages of friction.
- List the methods used for increasing and reducing friction.
- Explain the friction exerted by fluids: liquids and gases.

Textbook: Refer to pages 170 to 192

Periods allocated: 15 periods

VOCABULARY

Friction, spring balance, static friction, sliding fraction, rolling friction, lubricant, ball bearing, fluids, drag.

ACTIVITIES FOR PERIOD 1 AND 2

Friction: Direction, causes and factors affecting it (Page 171)

Learning Tools

Interactive warm up exercise: Ask the students what prevents a heavy box from moving when we push it with a small force.

Chapter opening exercise: Students should be asked which force acts when a ball is rolling on the ground so that it stops after some time.

Teacher guided discussion

Discuss with the students that the force which acts opposite to the direction in which the object is moving is frictional force. Its direction is opposite to the direction of motion of the object. Students

should know that it is caused due to the interlocking of irregularities in the surfaces of the two objects which are in contact with each other. Explain the working of spring balance to measure force acting on an object. Discuss that the friction between two surfaces depends on two factors: the nature of the two surfaces and the force with which two forces are pressed together.

Using resources

Conduct the activities given on pages 173 to 175 to study the dependence of friction on the nature of surfaces.

Suggested home assignment

Mention the characteristics of frictional force.

NEP

Experiential learning through indoor activity: The teacher can ask the students to move a book over a parallel layer of pencils on a wooden table.

Then ask them to move the book on the perpendicularly placed layer of pencils.

Let them identify in which case it is easier to move the book.

ACTIVITIES FOR PERIOD 3 AND 4

Static friction, sliding friction and rolling friction (Page 175)

Teacher guided discussion

Discuss with the students that friction is of three types: static friction, sliding friction and rolling friction. Students should be able to define the three types of friction and explain by giving examples. Explain the three types of friction with the help of the below mentioned activities.

Using resources

- Conduct the activity given on page no. 175 to explain the mechanism of static friction.
- Conduct the activity given on page no. 176 to explain the mechanism of sliding friction.
- Conduct the activity given on page no. 177 to explain the mechanism of rolling friction.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Define: Static friction, Sliding friction and Rolling friction.

ACTIVITIES FOR PERIOD 5 AND 6

Advantages of friction (Page 178)

Teacher guided discussion

Explain to the students that friction is necessary because it helps us to perform many of our daily life activities like it enables us to walk without slipping, it enables a car to move on road without skidding, it enables us to apply brakes and slow/stop a moving car, etc.

Suggested home assignment

List five advantages of friction.

NEP

21st Century skills: The teacher can ask the students to collect information from internet and discuss in the class how a lighting matchstick works.

ACTIVITIES FOR PERIOD 7

Disadvantages of friction (Page 181)

Teacher guided discussion

Discuss with the students that friction causes objects to wear away. Students should realize that friction may be harmful to us and considered an evil because it wears away the soles of our shoes, the tyres of vehicles, the rubbing machine parts, brake pads of vehicles, etc.

Suggested home assignment

Friction is a necessary evil. Justify the statement with the help of examples.

ACTIVITIES FOR PERIOD 8

Methods of increasing friction (Page 182)

Teacher guided discussion

Explain to the students that friction can be increased by making the surface rough. Friction can be increased by making grooves in soles of shoes, treads in the tyres of vehicles, spikes in the shoes of players, etc.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

What is done in the machine wheels to increase friction?

ACTIVITIES FOR PERIOD 9

Methods of reducing friction (Page 183)

Teacher guided discussion

Explain to the students that in some cases, friction is harmful to us and leads to the production of undesirable heat and loss of energy. Students should know that friction can be reduced by polishing the surfaces, by applying lubricants to surfaces, by using wheels to move objects and by using ball bearings between moving parts of machines.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

List some ways to minimise friction between two surfaces.

NEP

Local Knowledge: The teacher can ask the students to identify and name a few lubricants used at their home to reduce friction in the moving parts of the sewing machine, door knobs, carrom coins etc.

ACTIVITIES FOR PERIODS 10 AND 11

Fluid friction: Friction exerted by liquids and gases (Page 186)

Teacher guided discussion

Explain that substances which are able to flow easily are called fluids and the friction which arises when an object moves through a fluid is called fluid friction. Familiarize students with the term 'drag' which refers to the frictional force exerted by a fluid. Students should be able to state the factors on which the magnitude of frictional force depends. Students should realize the disadvantages of fluid friction and should be familiarized with the ways of reducing fluid friction.

Suggested home assignment

Why does the aeroplane have a streamlined shape?

ACTIVITIES FOR PERIOD 12

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 13

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 14 AND 15

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- | | | |
|--------------------|--------------------------|----------------------|
| (a) Friction | (b) (i) Smooth surfaces | (ii) Rough surfaces |
| (c) Spring balance | (d) Rolling friction | (e) Frictional force |
| (f) Ball bearings | (g) Bicycles, motor cars | (h) Rollers |
| (i) Oil and grease | (j) Fluid friction | (k) Streamline shape |

2. Fill in the following blanks with suitable words:-

- | | | |
|-----------------|-----------------|-----------------|
| (a) motion | (b) less | (c) heat |
| (d) slipping | (e) reduces | (f) roll |
| (g) drag | (h) streamlined | (i) streamlined |
| (j) streamlined | (k) bird | |

Subjective Type Questions

Short Answer Type Questions

1. When we push a box lying on the floor with a small amount of force, it does not move at all. It means that the surface of floor, on which the box is resting, exerts some force on the box which acts in a direction opposite to the force of our push. This natural force between the floor and the bottom of the box which opposes the motion of box on the floor is friction.
2. When an object has already started moving (or sliding), the irregularities on its surface do not get enough time to lock into the irregularities on the surface of the other object completely. Since the interlocking of the two surfaces is less when an object has already started moving, therefore, the sliding friction is smaller than the static friction.
3. When an object (like a wheel) rolls over the surface of another object, the resistance to its motion is called rolling friction.
4. Because of its smaller weight, the light box presses on the floor with less force and hence the friction between lighter box and floor is less. Because of its greater weight, the heavy box presses on the floor with a greater force. This greater friction does not allow the heavy box to be moved on floor by applying a small force. A much larger force of our push has to be applied to make the heavy box move on floor. Thus Seema has to push harder than Iqbal.
5.
 - (a) We are able to write and make drawings on paper because there is friction between the tip of pencil (or pen) and paper. We cannot write with a pencil on a glass sheet because the glass surface is very smooth due to which the friction between the tip of pencil and glass surface is much less. This friction is not sufficient to rub off black graphite particles from the tip of pencil.
 - (b) An oily or greasy pole has much less friction due to which it becomes difficult to climb up a greasy pole.
 - (c) Icy roads provide a smooth surface and there is less friction between the car wheels and the road. So car wheels spin on icy roads.
6. When the brakes of a vehicle (like car) are applied, a lot of friction is produced between the brake pads and moving part of the wheel (like disc). This friction wears out the brake pads gradually. Due to this, the brake pads of vehicles have to be replaced quite often (otherwise the brakes will not function properly).
7. Because of rubbing on the surface of paper and due to friction.
8. If we rub our hands together quickly for a few seconds, they feel warm. This is because friction between the hands produces heat (which makes them feel warm).
9. In order to take a step forward during walking, we lift one foot off the ground and push the ground backwards with the other foot. If there were no friction between the sole of our shoe and ground, then our shoe on the ground would slip backwards. Since we push the ground backwards, the force of friction acts in the opposite direction, forward direction, and prevents our foot from slipping backwards. So, it is the force of friction which makes us move forward at each step we take during walking. If there were no force of friction between the soles of our shoes and the ground, it would not be possible to walk (because our shoe would slip everytime we tried to walk).
10. Advantages: Friction enables us to light a matchstick. Friction enables us to cut wood with a saw.

Disadvantages: Friction wears away the soles of our shoes. The tyres of vehicles wear out gradually due to friction.

11. The players and athletes have to run fast. So, greater friction is required between the soles of their shoes and ground to prevent slipping. To increase friction, spikes are provided in the soles of shoes worn by players and athletes. Spikes are the pointed nails which get into the ground and increase friction between shoe and the ground. This prevents the slipping of player or athlete on running.
12. When oil or grease is applied to the moving parts of a machine, then their surfaces do not rub directly against each other, they rub through a layer of oil or grease (which is very smooth).
13. The objects having streamlined shapes face much less frictional force (or drag) when moving through a fluid than the objects which do not have streamlined shapes.
14. Those substances which are able to flow easily are called fluids. Fluids have no fixed shape. Liquids and gases are fluids (because they can flow easily).

Long Answer Type Questions

1. (a) The force which always opposes the motion of one object over another object in contact with it is called friction.
It has been found by experiments that the friction between two surfaces depends on two factors:
 - (i) The nature of the two surfaces (smoothness or roughness of the two surfaces).
For example: wrapping of polythene sheet makes the surface of brick smooth due to which the friction with floor decreases.
 - (ii) The force with which two surfaces are pressed together. For example: Since the surfaces of heavy box and floor are pressed together harder (with a greater force) the friction between them increases and becomes much greater. This greater friction does not allow the heavy box to be moved on floor by applying a small force. A much larger force of our push has to be applied to make the heavy box move on floor.
 - (b) Friction is caused by the interlocking of irregularities in the surfaces of the two objects which are in contact with each other. When we attempt to move one object over the other, we have to apply a force to overcome interlocking of the irregularities in their surfaces. More the roughness of a surface, larger is the number of irregularities on its surface and hence greater will be the friction. Thus, the force of friction is greater if very rough surfaces are involved. Refer to figure 4 for diagram.
2. (a) Place a brick on the floor. Tie a string (strong thread) around the brick and connect it to the hook of a spring balance. Apply a pulling force to the brick by pulling the other end of spring balance by hand till the brick just begins to slide (move slowly) on the floor. Note down the reading on spring balance when the brick begins to slide. This reading of spring balance will give us the magnitude of force of friction between the surface of floor and the surface of brick (which are in contact with each other). Let us now wrap a piece of polythene around the brick and repeat the above activity. We note the spring balance reading when the polythene wrapped brick just begins

to slide on the floor. We will find that this reading of spring balance is *smaller* than the first reading of spring balance (when there was no polythene around the brick) indicating that the force of friction has decreased. From this observation we conclude that wrapping of polythene sheet makes the surface of brick smooth due to which the friction with floor decreases.

- (b) Suppose we have two boxes of the same size but one box is light and the other box is heavy. If we push both the boxes on the floor, one by one, we will find that we have to apply only a small force to make the lighter box move on the floor but a much larger force has to be applied to make the heavier box move on the floor. This shows that there is less friction between the light box and floor but much more friction between the heavy box and the floor. We know that the weight of a box is also a force (which acts in the downward direction). Now, because of its smaller weight, the light box presses on the floor with less force and hence the friction between lighter box and floor is less. This lesser force of friction allows the lighter box to be moved easily by applying a smaller push. On the other hand, because of its greater weight, the heavy box presses on the floor with a greater force. Since the surfaces of heavy box and floor are pressed together harder (with a greater force) the friction between them increases and becomes much greater. This greater friction does not allow the heavy box to be moved on floor by applying a small force. A much larger force of our push has to be applied to make the heavy box move on floor.
3. (a) The maximum frictional force present between any two objects when one object just tends to move or slip over the surface of the other object, is called static friction. Static friction is a kind of starting friction because an object just tends to start moving, it does not actually move. The object remains static (or stationary) in this case. The frictional force present when one object moves slowly (or slides) over the surface of another object, is known as sliding friction. Thus, sliding friction comes into play when an object is sliding (moving slowly but continuously) over another object. The static friction is greater than sliding friction.
- (b) Heavy machines can be easily moved from one place to another by placing round logs of wood under them and then pushing with the force of hands. The round logs of wood act as rollers (a kind of wheels) and make it much easier to move the heavy machine kept on them.
4. (a) The frictional force exerted by a fluid (air or water) is called drag (or drag force). Thus, drag is a kind of frictional force exerted by a fluid (like air or water) which opposes the motion of an object through that fluid. Drag force acts in a direction opposite to the direction of motion of the object. Typical examples of drag forces are the air resistance force experienced by a car or an aeroplane when they move at high speeds, and the water resistance force experienced by a speedboat moving rapidly in the sea.
- (b) The fluid friction (or drag) can be reduced or minimised by giving special shape called 'streamlined shape' to the objects which move through fluids (like air or water).
5. (a) A 'body shape' which offers very little resistance to the flow of air or water around it, is called streamlined (or streamlined shape). An aeroplane has a streamlined shape to reduce air friction (air resistance or drag) that it encounters when flying at high speed through the sky.

- (b) The fluid friction (or drag) can be reduced or minimised by giving special shape called 'streamlined shape' to the objects which move through fluids (like air or water). When an object having a streamlined body shape moves very fast, then the fluid (air or water) can flow past the moving object smoothly, reducing the fluid friction (or drag). For example, cars are built with streamlined body shape to reduce air resistance (or drag) caused by air. A car with streamlined shape moves through the air easily (without facing much air resistance) and hence consumes less petrol than another car of same size running at the same speed that has a shape which gives it more air resistance (or drag). More streamlined the shape of a car, less petrol it will consume.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|---------|--------|---------|
| 1. (a) | 2. (c) | 3. (c) | 4. (a) | 5. (b) |
| 6. (c) | 7. (b) | 8. (d) | 9. (c) | 10. (b) |
| 11. (c) | 12. (c) | 13. (c) | | |

Case Based Questions

1. Riya slipped on the wet marble floor due to the reduction of friction between her shoes and the slippery surface.
2. As the floor was wet a layer of water on the floor reduced the friction between the shoes of Riya and the floor.
3. Riya could have walked more slowly and carefully, increasing the friction between her shoes and the wet floor to prevent slipping.
4. Friction enables us to write and draw. It also helps to light a matchstick.
(Students can give their own answers also.)

Assertion-Reason Based Questions

1. (c) Streamlined shape of airplane reduces air friction (air resistance or drag) that it encounters when flying at high speed through the sky. Therefore, A is correct but R is incorrect.
2. (c) Rolling friction is much smaller than the sliding friction, so sliding friction is replaced in most of the machines by using ball bearings. Therefore, A is correct but R is incorrect.
3. (d) A is incorrect, but R is correct. Friction reduces the efficiency of machines as some energy is wasted as explained in the reason statement.
4. (a) A and R both are correct and R is the correct explanation of A.



21st Century Skills

1. Floor B offers greater friction (because it makes the moving pencil cell stop at a lesser distance of 20 cm).
2. Towards South (opposite to direction of motion of car).
3. (a) Sliding friction (b) Static friction (c) Rolling friction.
4. When a person is sitting on the mat, then due to the weight of the person, the mat and floor are pressed together harder, increasing the friction too much.

Name: Class: Date:

A. Objective Type Questions

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) Friction always opposes between the surfaces in contact with each other.
- (b) Objects which can move quickly through water have shape.
- (c) Cars and speedboats are to reduce drag.
- (d) Friction produces
- (e) Sliding friction is than the static friction.

2. Name the following:

- (a) The force which always opposes motion.
- (b) Force responsible for the wearing out of car tyres.
- (c) A common lubricant.
- (d) Device used between the hubs and axles of bicycle wheels to reduce friction.
- (e) Surface producing least friction.

B. Short Answer Type Questions

1. What is a spring balance?
2. Why it is more difficult to walk on a wet marble floor?
3. Why is it more difficult to walk properly on a well-polished floor?
4. What is done to increase friction between the tyres and road?
5. Why do gymnasts apply a coarse substance to their hands?
6. Name any two machines in which ball bearings are used.
7. Why does oiling the axles of a bicycle make the bicycle move more easily?
8. Why are grooves provided in the soles of shoes?
9. Why are treads made in the surface of tyres?
10. Why do we sprinkle fine powder on carom board?

10

Sound

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Recognise that sound is produced by vibrating objects.
- Demonstrate the working of vocal cords for the sound produced by humans.
- Explain that sound needs a medium for its propagation.
- Compare the speed of sound in solids, liquids and gases.
- Outline the structure and functioning of human ear.
- Define and relate the terms- amplitude, time period and frequency of vibrations.
- Explain the characteristics of sound: its loudness, pitch and quality.
- Categorise sound vibrations as audible or inaudible sounds.
- Identify how different types of musical instruments produce sound.
- Differentiate musical sound from noise.
- List the sources of noise pollution, and various measures of controlling it.

Textbook: Refer to pages 193 to 217

Periods allocated: 14 periods

VOCABULARY

Sound, larynx, vocal cords, amplitude, time period, frequency, loudness, pitch, quality, audible sound, inaudible sound, noise, music, noise pollution.

ACTIVITIES FOR PERIOD 1

Sound is produced by vibrating objects (Page 194)

Learning Tools

Interactive warm up exercise: Discussing sound as a form of energy would be a good start for the topic. Discuss with the students about vibrations and vibratory motion.

Chapter opening exercise: Students should be asked the names of different musical instruments. Make the topic interesting by asking how sound is produced when cups are filled with water and musical sound is produced from them in the musical instrument jal-tarang.

Teacher guided discussion

Discuss with the students that sound is that form of energy which makes us hear. Sound is produced by vibrating objects. Students should be able to list the various methods by which sound can be produced. Explain that propagation of sound occurs when an object vibrates and makes sound, and the air around it also starts vibrating in exactly the same way and carries sound to our ears through the vibrations of its molecules.

Suggested home assignment

What are the methods by which sound can be produced?

ACTIVITIES FOR PERIOD 2

Sound produced by humans (Page 196)

Teacher guided discussion

Discuss with the students that the human beings produce sound by using the voice box which is called larynx. It contains two ligaments called vocal cords. The lungs pass a current of air between the two vocal cords. This air makes the vocal cords vibrate and the vibrating vocal cords produce sound.

Suggested home assignment

Why is the frequency of woman's voice higher than that of a man?

ACTIVITIES FOR PERIOD 3

Sound needs a medium for propagation (Page 197)

Teacher guided discussion

Explain to the students that sound can travel through solids, liquids and gases but it cannot travel through vacuum. It cannot travel through vacuum because vacuum has no molecules which can vibrate and carry sound waves. Discuss the case of moon with the students to make the topic interesting. Tell them that Sound cannot be heard on the surface of moon because there is no air on the moon to carry the sound waves.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Why sound cannot be heard on the surface of moon?

ACTIVITIES FOR PERIOD 4

Speed of sound (Page 200)

Teacher guided discussion

Explain to the students that sound travels slowest in gases, faster in liquids and fastest in solids. Students should be aware that sound travels at a slow speed but light travels much faster than sound.

Suggested home assignment

Why is the flash of lightning seen first and thunder heard a little later?

ACTIVITIES FOR PERIOD 5

We hear through our ears (Page 201)

Teacher guided discussion

Students should be able to comprehend the construction and working of ear. Explain that the ear has three tiny bones in the middle part of the ear which act as a system of levers and amplify sound vibrations coming from the eardrum before passing them on to the inner part of the ear (cochlea). Students should be sensitised that they should not put anything in the ear because our ears are very delicate organs. Explain them the working of eardrum with the help of an activity.

Suggested home assignment

Why should we not put pin, pencil or pen inside our ears? Draw a neat and labelled diagram of the structure of human ear.

ACTIVITIES FOR PERIOD 6

Amplitude, time period and frequency of a vibration (Page 202)

Teacher guided discussion

Explain to the students that the maximum displacement of a vibrating object from its central position is called the amplitude of vibration. The time taken by a vibrating object to complete one vibration is called the time period. The number of vibrations made in one second is called the frequency of vibration. Students should be aware that the time period is equal to the reciprocal of frequency.

Suggested home assignment

A pendulum makes 15 oscillations in 5 seconds. What is the frequency of the pendulum?

ACTIVITIES FOR PERIOD 7

Characteristics of sound: Loudness, pitch and quality (Page 204)

Teacher guided discussion

Explain to the students that the loudness of the sound depends on the amplitude of vibrations of the vibrating object. It is directly proportional to the square of amplitude of vibration and is expressed in decibel. Pitch is that characteristic of sound by which we can distinguish between different sounds of the same loudness. It depends on the frequency of vibration. Quality is that characteristic of sound which enables us to distinguish between the sounds produced by different sound producing objects even if they are of same loudness and pitch.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Define: Loudness, Pitch and Quality.

ACTIVITIES FOR PERIOD 8

Audible and inaudible sounds (Page 208)

Teacher guided discussion

Explain to the students that all vibrating objects do not produce audible sounds. Students should know the frequencies of infrasonic sounds and ultrasonic sounds. They should know the frequency of ultrasound and its important uses.

Suggested home assignment

List the various uses of ultrasound.

NEP

21st Century skills: The teacher can ask the students to explore internet and find out the applications of ultrasound and infrasonic sound for medicinal, industrial purposes; in oceanography space exploration, study of rocks, monitoring earthquakes, etc.

ACTIVITIES FOR PERIOD 9

Noise and music (Page 209)

Teacher guided discussion

Explain to the students that the unpleasant sounds around us are called noise. The sounds which are pleasant to hear are called musical sounds.

Suggested home assignment

When does a musical sound become noise?

ACTIVITIES FOR PERIOD 10

Musical instruments (Page 210)

Teacher guided discussion

Explain them that the arrangement of sounds of different frequencies called notes in a way that is pleasant to hear, is called music. Students should know there are four types of musical instruments: Stringed, wind, membrane and plate type musical instruments. Discuss each of these in detail with the students.

Suggested home assignment

Explain the working of jal-tarang musical instrument.

NEP

Life Skills (Playfulness): The teacher can show flashcards displaying pictures of musical instruments like drum, piano, violin, electric bells, flute, clarinet etc. Students are asked to identify and categorize them as stringed, percussion or air blown musical instruments.

ACTIVITIES FOR PERIOD 11

Noise pollution (Page 211)

Teacher guided discussion

Explain that the presence of loud, unwanted and disturbing sounds in our environment is called noise pollution. Students should know the major sources, harms and measures to control noise pollution. Sensitise students with the fact that some people are born with poor hearing and can use a hearing aid if there is partial loss of hearing.

Suggested home assignment

What is hearing impairment and how can it be corrected?

NEP

Life Skills (Communication): The teacher can organize a group discussion on 'noise pollution, its effects and remedies'.

ACTIVITIES FOR PERIOD 12

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 13

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 14

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- | | |
|-------------------------|-------------------------------|
| (a) Larynx | (b) Metal |
| (c) Eardrum | (d) Hammer, anvil and stirrup |
| (e) Frequency | (f) Amplitude |
| (g) Decibel | (h) Pitch |
| (i) Quality (or Timbre) | (j) Decibel |
| (k) Ultrasonic sound | (l) Loudness |
| (m) Vacuum | (n) Air |

2. Fill in the following blanks with suitable words:

- | | |
|-----------------|------------|
| (a) vibrating | (b) larynx |
| (c) bones | (d) hertz |
| (e) time-period | (f) noise |
| (g) musical | (h) aid |

3. State whether the following statements are true or false :-

- | | | | | |
|-----------|-----------|-----------|-----------|----------|
| (a) True | (b) False | (c) False | (d) False | (e) True |
| (f) False | (g) True | | | |

Subjective Type Questions

Short Answer Type Questions

1. (a) The vocal cords are a kind of strings.
- (b) When we want to speak, the muscles of vocal cords contract due to which the two vocal cords become stretched and close together leaving only a narrow slit between them. The lungs pass a current of air between the two vocal cords. This air makes the vocal cords vibrate.
2. If we want to hear a train approaching from far away, it is more convenient to put the ear to the railway track (railway line) because the sound of train travels much more faster through solid railway track made of steel than through air.
3. It is a common observation that in the rainy season, the flash of lightning is seen first and the sound of thunder is heard a little later (though both are produced at the same time in clouds). It is due to the very high speed of light that we see the flash of lightning first and it is due to comparatively low speed of sound that the thunder is heard a little later.
4. (a) sitar (b) flute (c) table (d) cymbals
5. Can be heard: 5000 hertz, 10000 hertz, 18 kHz; Cannot be heard : 6 hertz, 35000 hertz
6. (a) A repeated 'back and forth' motion is called vibration (or oscillation). The maximum displacement of a vibrating object from its central position is called the amplitude of vibrations.
(b) 20 Hz
7. (a) (i) by vibrating strings (as in a *sitar*) and (ii) by vibrating air columns (as in a flute).
(b) When an object vibrates (and makes sound), then the air around it also starts vibrating in exactly the same way and carries sound to our ears through the vibration of its molecules.
8. (a) Sound cannot be heard on the surface of moon because there is no air on the moon to carry the sound waves (or sound vibrations).
(b) The astronauts who land on moon (or walk in outer space) talk to each other through wireless sets using radio waves. This is because radio waves can travel even through vacuum (though sound waves cannot travel through vacuum).
9. (a) Pitch is that characteristic of sound by which we can distinguish between different sounds of the same loudness. Quality is that characteristic of sound which enables us

to distinguish between the sounds produced by different sound producing objects (like different musical instruments or different singers) even if they are of same loudness and pitch.

- (b) The sounds having too high frequency (greater than 20,000 Hz) which cannot be heard by human beings is also called just 'ultrasound'. Uses of Ultrasound are: (i) Ultrasound is used as a diagnostic tool in medical science to investigate inside of the human body. (ii) Ultrasound is used to study the growth of foetus (developing baby) inside the mother's womb.
10. (a) (i) Sound will become louder (ii) Sound will become high pitched (b) 0.1 s
11. (a) If we hit the stretched membrane (or skin) of a *tabla*, the membrane starts vibrating and produces a sound. Now, if we put a few small pebbles on the membrane of this sound producing *tabla*, the pebbles will start jumping up and down showing that the *tabla* membrane is vibrating while producing sound. Thus, sound is produced when the membrane (or skin) of a *tabla* vibrates. When we strike at the membrane (or skin) of a drum, it vibrates to produce sound. Thus, sound is produced when the stretched membrane (or skin) of a drum vibrates.
- (b) The loudness of sound depends on the amplitude of vibrations of the vibrating object.
12. (a) Noise pollution. (b) This is because they can tear the eardrum. The tearing of eardrum can make a person deaf. Our ears are very delicate organs. We should take proper care of our ears and protect them from damage.
13. The unpleasant sounds around us are called noise. Noise is produced by the irregular vibrations of the sound producing source. Some of the examples of noise are as follows: Running of mixer and grinder in the kitchen produces noise; Blowing of horns of motor vehicles (like cars, buses and trucks, etc.) causes noise; Bursting of crackers produces noise; Barking of dogs produces noise. The sounds which are pleasant to hear are called musical sounds (or music). Musical sounds (or music) are produced by the regular vibrations of the sound producing source. Some of the examples of musical sounds (or music) are as follows: The strings of a *sitar* make regular vibrations, so a *sitar* produces musical sound. The sound produced by a harmonium is also a musical sound. In fact, all the musical instruments (like *sitar*, *veena*, guitar, violin, piano, flute, *shehnai*, *tabla*, *dholak* and *mridangam*, etc.) produce musical sounds. If, however, a musical sound becomes too loud, it would become noise.

Long Answer Type Questions

- We can hear the sound of ringing bell clearly. Thus, when air is present in the glass jar, sound can travel through it and reach our ears. If the glass jar containing ringing bell is placed over the plate of a vacuum pump, air is gradually removed from the glass jar by switching on the vacuum pump. As more and more air is removed from the glass jar, the sound of ringing bell becomes fainter and fainter. And when all the air is removed from the glass jar, no sound can be heard at all (though we can still see the clapper striking the bell). Thus, when vacuum is created in the glass jar, then the sound of ringing bell placed inside it cannot be heard. This shows that sound cannot travel through vacuum (and reach our ears). Refer to figure 6 for the diagram.
- (a) The time taken by a vibrating object to complete one vibration is called its time-period. The unit of measuring time-period is 'second'.

- (b) The number of vibrations made in one second is called the frequency of vibration. Frequency is measured in hertz. c. (i) 0.1 s (ii) 10 Hz ; No because it is an infrasonic sound of frequency 10 hertz which is below our hearing range.
3. Refer to Figure 8 for the diagram. The sound waves (coming from a sound producing body) are collected by the pinna of outer part of ear. These sound waves pass through the ear canal and fall on the eardrum. When the sound waves fall on the eardrum, the eardrum starts vibrating back and forth rapidly. The vibrating eardrum causes a small bone hammer to vibrate. From hammer, vibrations are passed on to second bone 'anvil' and then to the third bone 'stirrup'. The vibrating stirrup strikes on the membrane of oval window and passes the amplified vibrations to the liquid in cochlea. Due to this, liquid in cochlea begins to vibrate. The vibrating liquid of cochlea sets up electrical impulses in the nerve cells present in it. These electrical impulses are carried by auditory nerve to the brain. The brain interprets these electrical impulses as sound and we get the sensation of hearing.
4. (a) The unpleasant sounds around us are called noise. Sounds are considered noise when very loud music is played at a disco and when a band plays loudly during a marriage procession.
- (b) The sounds which are pleasant to hear are called musical sounds (or music). Musical sounds (or music) are produced by the regular vibrations of the sound producing source. Some of the examples of musical sounds (or music) are as follows: The strings of a *sitar* make regular vibrations, so a sitar produces musical sound. The sound produced by a harmonium is also a musical sound.
5. (a) Sounds that are loud and unnecessary are called noise. The presence of loud, unwanted and disturbing sounds in our environment is called noise pollution. Some of the major sources of noise pollution in the environment around us are as follows :
- (i) The motor vehicles (like cars, buses and trucks, etc.) running on the road produce noise pollution by blowing horns and sounds of their engines.
- (ii) The bursting of crackers on various social and religious occasions produces noise pollution.
- (b) Excessive loud noise is harmful to us. The presence of excessive noise in the surroundings may cause many health-related problems. The various harms of noise pollution (or loud noise) are as follows:
- (i) Loud noise can cause great harm to our ears. Constant loud noise reduces the hearing power of our ears. Loud noise can even damage the ears permanently and cause deafness.
- (ii) Loud noise can cause a person to lose concentration in his work or studies.
- (iii) Loud noise can cause an ailment called hypertension (high blood pressure).
- (iv) Loud noise can cause irritation and headache.
- (v) Loud noise during night-time disturbs our sleep. Continued lack of sleep is bad for health.
- (c) Noise pollution should be controlled to prevent its harmful effects on human beings and other living things. We can control the noise pollution to some extent by taking the following measures :

- (i) We should not play radio, stereo-systems and television too loudly.
 - (ii) The horns of motor vehicles should not be blown unnecessarily.
 - (iii) The bursting of crackers should be avoided.
 - (iv) The noise-making factories and airports should be shifted away from the residential areas of the city.

(d) Trees should be planted along the roads and around buildings to reduce the noise pollution from the roads and other activities from reaching the residents of the area.

Competency-Based Questions

Multiple Choice Questions

- 1.** (d) **2.** (c) **3.** (c) **4.** (b) **5.** (c)
6. (b) **7.** (c) **8.** (d) **9.** (b) **10.** (a)
11. (d) **12.** (d)

Case Based Questions

Assertion-Reason Based Questions

1. (b) A and R both are correct, but R is not the correct explanation of A. Sound waves always require a medium to travel so it cannot travel through vacuum.
 2. (a) A and R both are correct, and R is the correct explanation of A.
 3. (c) Voice of a baby has higher frequency (higher pitch) than that of a woman. Therefore, A is correct, but R is incorrect.
 4. (d) A is incorrect, but R is correct. Harmonium is a keyboard wind musical instrument.



21st Century Skills

1. X: Ultrasonic sound; Y: Infrasonic sound; Z: Audible sound
 2. I would suggest my parents to buy the house which is three lanes away from the busy road. This is because being away from the busy road will reduce noise pollution caused by heavy traffic on the road
 3. (a) 0.002 s (b) 500 hertz (c) Yes ; Because its frequency is within the hearing range of humans.
 4. Amplitude of vibrations small, so feeble sound ; Amplitude of vibrations large, so loud sound.

WORKSHEET– CLASS 8, CHAP. 10 SOUND

Name: Class: Date:

A. Objective Type Questions

1. Sound can travel through:

- | | |
|-----------------|------------------------------|
| (a) Gases only | (b) Solids only |
| (c) Liquid only | (d) Solids, liquid and gases |

2. When we change a feeble sound to a loud sound, we increase its:

- | | |
|---------------|---------------|
| (a) Frequency | (b) Amplitude |
| (c) Speed | (d) Timbre |

3. One of the following can hear infrasound. This one is:

- | | |
|----------------|------------|
| (a) Dog | (b) Bat |
| (c) Rhinoceros | (d) Humans |

4. The ultrasound waves can penetrate into matter to a large extent because they have:

- | | |
|-----------------------|-------------------------|
| (a) Very high speed | (b) Very high frequency |
| (c) Very high quality | (d) Very high amplitude |

5. The frequencies of four sound waves are given below. Which of these sound waves can be used to measure the depth of sea?

- | | |
|---------------|---------------|
| (a) 15,000 Hz | (b) 10 k Hz |
| (c) 50 k Hz | (d) 10,000 Hz |

6. The sound waves travel fastest:

- | | |
|---------------|----------------|
| (a) In solids | (b) In liquids |
| (c) In gases | (d) In vacuum |

7. What characteristic makes a woman's voice shrill compared to a man's voice?

- | | |
|--------------|---------------|
| (a) Quality | (b) Pitch |
| (c) Loudness | (d) Amplitude |

8. People in space communicate with each other using:

- | | |
|-----------------|--------------------------------|
| (a) Radio waves | (b) Infrasonics |
| (c) Ultrasonic | (d) Waves of audible frequency |

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) Unpleasant sound is called
- (b) The unit of frequency is
- (c) The time taken by an object to complete one oscillation is called
- (d) The shrillness of a sound is determined by the of vibration.
- (e) The human voice box is called

2. Name the following:

- (a) The part of our body which vibrates when we speak.
- (b) One liquid through which sound can pass through.
- (c) The nerve which carries electrical impulses from the cochlea of ear to the brain.
- (d) The quantity whose unit is Hertz.
- (e) Passage in outer ear which carries sound waves to the eardrum.

B. Short Answer Type Questions

1. What is the length of vocal cords in a man?
2. Is the speed of sound more in water or in steel?
3. In which medium sound travels fastest: air, water or steel?
4. Out of solids, liquid and gases:
 - (a) In which medium sound travels slowest?
 - (b) In which medium sound travels fastest?
5. Name that part of ear which vibrates when outside sound falls on it.
6. Name the three tiny bones present in the middle part of ear and state their functions.
7. Name the nerve which carries electrical impulses from the cochlea of ear to the brain.
8. What is the relation between ‘time-period’ and frequency’ of an oscillating body?
9. How does loudness depend on the amplitude of vibrations?
10. Name the unit used to measure the loudness of sound. Also write its symbol.

11

Chemical Effects of Electric Current

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Define good and poor conductors of electricity.
- Categorise liquids as electrolytes and non-electrolytes based on conduction of electricity.
- Identify a LED and its use for detecting weak currents.
- Explain the chemical effects of electric current.
- Outline the principle, process and applications of electroplating.
- Identify how chemical effect of electric current is used in the purification of metals.

Textbook: Refer to pages 218 to 234

Periods allocated: 12 periods

VOCABULARY

Electrolyte, electrode, cathode, anode, electrolytic cell, light emitting diode, electrolysis, electroplating, purification.

ACTIVITIES FOR PERIODS 1 AND 2

Do liquids conduct electricity (Page 218)

Learning Tools

Interactive warm up exercise: Discussing with the students the various good and poor conductors of electricity would be a good start for the topic.

Chapter opening exercise: Students should be asked why an electrician should wear rubber gloves before doing electric repairs.

Teacher guided discussion

Discuss with the students that some of the liquids also conduct electricity. They are solutions of acids, bases and salts in water. In this case, electricity is carried by ions. Students should know that liquids that can conduct electricity are called electrolyte. A solid electrical conductor through which an electric current enters or leaves is called an electrode. Positively charged electrode is called anode while negatively charged electrode is called cathode. If weak electric current is flowing through liquids, it can be detected by two ways: LED or by using a compass. Explain the construction and working of light emitting diode to students. Explain that with the presence of salt and acid in distilled water and rainwater respectively, they can be made to conduct electricity.

Using resources

- Conduct the activity given on page no. 220 to show the liquids that conduct electricity and which do not.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Which of the following is the best conductor of electricity among the following?

Rainwater, distilled water, tap water and sea water.

NEP

Experiential learning through indoor activity: The teacher can take the students to school laboratory and show them an electric circuit made using copper wire, LED bulb, and battery.

Students are asked to pour a teaspoon of liquids, namely, distilled water, milk, sugar solution and lemon juice one by one, in a plastic bottle whose cap is discarded off.

The free ends of copper wire are dipped in them and students are asked to observe in which case the bulb glow brightly, where it is dim and in which case it doesn't glow at all.

The students are also asked to categorise these liquids as good or poor conductors of electricity.

ACTIVITIES FOR PERIOD 3 AND 4

Chemical effects of current (Page 224)

Teacher guided discussion

Discuss that electric current can bring about chemical changes, so it is said to have a chemical effect. The chemical decomposition produced by passing an electric current through a conducting liquid is called electrolysis. Explain that William Nicholson showed that if electric current is passed through acidified water, then bubbles of oxygen gas and hydrogen gas are produced at the two electrodes immersed in it. Students should be able to list the effects which may be produced by the chemical reactions brought about by electric current.

Using resources

- Conduct the activity given on page no. 224 to demonstrate the electrolysis of water.
- Conduct the activity given on page no. 225 to demonstrate the change in colour caused by the chemical effect of electric current.

Suggested home assignment

Do fresh fruits and vegetables conduct electricity? Give reason for your answer.

ACTIVITIES FOR PERIOD 5 AND 6

Electroplating (Page 226)

Teacher guided discussion

Explain to the students that the process of depositing a thin layer of a desired metal over a metal object with the help of electric current is called electroplating. Electroplating is usually done using the metals chromium, tin, nickel, silver, gold or copper. Explain the electroplating of an iron object using copper metal in detail. Discuss the uses of electroplating. Metals like chromium and tin are shiny and do not corrode.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

List the points to be considered while electroplating.

NEP

Local Knowledge: The teacher can ask the students to observe different articles at their home which are electroplated and name the metals used for electroplating them.

ACTIVITIES FOR PERIOD 7 AND 8

Purification of metals (Page 229)

Teacher guided discussion

Discuss with the students that the chemical effect of electric current is used in the purification of impure metals. Explain the process of purification by demonstrating the below mentioned activity. Also explain them the use of chemical effect of electric current in production of metals, production of compounds and decomposition of compounds.

Using resources

Conduct the activity given on page no. 229 to show the purification of impure copper metal.

Suggested home assignment

Explain the process of purification of impure metals using the chemical effect of electric current.

NEP

21st Century skills: The teacher can ask the students to explore internet and find out how caustic soda is obtained from aqueous brine solution.

ACTIVITIES FOR PERIOD 9

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 10

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 11 AND 12

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- (a) Vinegar and dilute hydrochloric acid conduct electricity while milk and oil do not conduct electricity.
- (b) LED
- (d) Electroplating
- (f) Bathroom taps ; Bicycle handlebars
- (h) Silver or Gold
- (j) Copper and zinc
- (l) Water (acidified)
- (c) Light Emitting Diode
- (e) Chromium
- (g) Electroplating
- (i) Electrolytes
- (k) Sodium hydroxide

2. Fill in the following blanks with suitable words:-

- (a) acids ; bases ; salts
- (c) chemical
- (e) electroplating
- (b) weak
- (d) hydrogen ; oxygen
- (f) negative

Subjective Type Questions

Short Answer Type Questions

1. **Conduct electricity:** lemon juice, vinegar, common salt solution, sulphuric acid solution, sea water, rain water. **Do not conduct electricity:** milk, sugar solution, distilled water, honey.
2. It is dangerous to operate an electric switch or touch a working electrical appliance with wet hands because the tap water present on wet hands is a conductor of **electricity** due to which it may conduct electric current from the electric switch (or electrical appliance) to our hand and give us an electric shock.
3. LED is a semiconductor device which glows even when a very weak current passes through it.

4. (a) Heating effect of current
(b) Magnetic effect of current
5. Magnetic needle of compass will show deflection. This is because electric current flowing through a wire produces a magnetic field around it. And this magnetic field of electric current acts on the magnetic needle of the compass and deflects it from its usual north-south position.
6. Distilled water is a poor conductor (or non-conductor) of electricity because it does not contain any dissolved salts in it (which can provide it ions to conduct electricity). Thus, distilled water is pure water and it does not conduct electricity. Tap water is a conductor of electricity because it contains small amounts of various salts dissolved in it.
7. Bicycle handlebar is made of a cheaper metal (like iron or steel) and only a thin coating of chromium metal is deposited all over its surface by electroplating (chromium plating). After chromium plating, it looks as if the whole iron (or steel) handlebar is made of the chromium metal. If, however, the thin layer of chromium plating on an object is accidentally scratched, then the shiny coating of chromium comes off and the iron or steel surface beneath it gets exposed. Rusting of iron and steel objects can then take place.
8. The solution conducts electric current. This electric current produces magnetic effect around the wire and deflects magnetic needle.
9. A red-brown layer of copper metal will be deposited on the carbon rod connected to the negative terminal of the battery. The carbon rod will get copper-plated.
10. In case of a fire, before the firemen use big water hoses (flexible water pipes) to throw water on a burning house (or building), they usually cut off the electricity supply of that area. The electric supply is cut off to prevent electrocution of firemen who are busy in fire-fighting operations. Ordinary water is a conductor of electricity, so if the electricity supply is not cut off and firemen come in contact with wet electric switches, electric wires and other electrical appliances, they may get electrocuted.
11. (a) Chemical effect ; Electroplating (b) Negative terminal of battery ; Copper sulphate

Long Answer Type Questions

1. (a) The chemical changes which take place in conducting liquids on passing electric current through them are called chemical effects of electric current. Take a small beaker. Fix two iron nails on a rubber cork about 1 cm apart and place this cork in the beaker. The two iron nails will act as the two electrodes. Connect the two nails to the two terminals of a battery by including a torch bulb and a switch in the circuit. Pour a solution of dilute hydrochloric acid in the beaker carefully. Now pass electric current through the hydrochloric acid solution by closing the switch. We will observe that as soon as we switch on the current, the bulb starts glowing. The bulb can glow only if the hydrochloric acid solution taken in the beaker conducts electricity (making the circuit complete). So, the glowing of bulb in this case tells us that hydrochloric acid solution conducts electricity.
(b) (i) Electroplating metals and (ii) Purification of metals are the two applications of chemical effect of current.

- (c) The chemical decomposition produced by passing an electric current through a conducting liquid is called electrolysis. The decomposition of acidified water into hydrogen and oxygen by passing an electric current (or electricity) is an example of electrolysis. Please note that pure water is not a good conductor of electricity. Water is made an electricity ‘conducting liquid’ by the addition of a small amount of acid to it. The water containing a little of acid is called ‘acidified water’. We use acidified water for carrying out the electrolysis of water.
2. (a) Acids, bases and salts.
(b) The chemical reactions brought about by an electric current may produce one (or more) of the following effects :
 - bubbles of a gas (or gases) may be formed on the electrodes.
 - deposits of metals may form on electrodes.
 - changes in colour of solutions may occur.(c) because of the heating effect of current.
3. (a) The process of depositing a thin layer of a desired metal over a ‘metal object’ with the help of electric current is called electroplating. The purpose of electroplating is to protect the metal objects from corrosion (or rusting) or to make the metal objects look more attractive.
(b) Chromium metal has a shiny appearance and it does not corrode (it does not rust).
4. (a) A thick rod of impure metal is made positive electrode (or anode): It is connected to the positive terminal of the battery.
(b) A thin strip of pure metal is made negative electrode (or cathode): It is connected to the negative terminal of the battery.
(c) A water soluble salt of the metal to be purified is taken as electrolyte.
On passing electric current, the metal dissolves from the impure anode and goes into electrolyte solution. The metal present in dissolved form in electrolyte gets deposited on the cathode in the pure form. The impurities are left behind in the electrolyte solution. Refer to Figure 11 for diagram.
5. Refer Figure 9 for the diagram. Take 250 mL of distilled water in a clean beaker. Dissolve two teaspoonfuls of copper sulphate in it. This will give us a blue coloured copper sulphate solution. Add a few drops of dilute sulphuric acid to copper sulphate solution to make it more conducting. Take a copper plate of about 10 cm × 4 cm size and a door key made of iron. Clean the surfaces of copper plate and iron key by rubbing with sand paper. Then wash them with water and dry them. Immerse the cleaned copper plate in copper sulphate solution in the beaker. Connect the copper plate to the positive terminal of a battery through a switch. This copper plate becomes the positive electrode (or anode). Immerse the cleaned iron key also in copper sulphate solution at a small distance from the copper plate. Connect the negative terminal of the battery to the iron key. This iron key becomes the negative electrode (or cathode). Switch on the electric current by closing the switch. Allow the current to pass for about 15 minutes. Now remove the copper plate and iron key from the copper sulphate solution and look at them carefully. We will find that the copper

plate has dissolved a little and the iron key has got a reddish layer of copper metal all over its surface. Thus, the iron key has been electroplated with copper.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|--------|--------|---------|
| 1. (b) | 2. (b) | 3. (c) | 4. (d) | 5. (c) |
| 6. (d) | 7. (b) | 8. (c) | 9. (d) | 10. (d) |
| 11. (c) | 12. (a) | | | |

Case Based Questions

1. Electroplating

The process of depositing a thin layer of a desired metal over a metal object with the help of electric current is called electroplating.

2. To electroplate the silver jewellery with gold, the silver jewellery must be placed at the cathode.
3. Tin 'cans' used for storing food are made by electroplating tin metal on to iron.

Assertion-Reason Based Questions

1. (b) A and R both are correct, but R is not the correct explanation of A. The conducting solutions (or electrolytes) used in electroplating process are water soluble salts of various metals and are polluting wastes and hence should be disposed of in a proper way to protect the environment.
2. (a) A and R both are correct and R is the correct explanation of A.
3. (d) Torch bulb cannot be used to detect weak electric current flowing through a liquid in a circuit. Therefore, A is incorrect but R is correct.
4. (a) A and R both are correct and R is the correct explanation of A.



21st Century Skills

1. Sea water contains a large amount of dissolved salts in it. Due to the presence of a large amount of dissolved salts in it, sea water is a much better conductor of electricity than drinking water (which contains only a small amount of dissolved salts in it). The greater electric current passing through sea water produces stronger magnetic field in wire and hence deflects the compass needle more.
2. (a) Thick rod of impure copper (b) Thin plate of pure copper (c) Copper sulphate solution
3. The rainwater falling through the atmosphere dissolves some acidic gases such as carbon dioxide, sulphur dioxide and nitrogen oxides and hence becomes acidic. This acidic rainwater conducts electric current which produces magnetic field and deflects the compass needle

WORKSHEET – CLASS 8, CHAP. 11 CHEMICAL EFFECTS OF ELECTRIC CURRENT

Name: Class: Date:

A. Objective Type Questions

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- The process of depositing a layer of any desired metal on another metal by means of electricity is called
- The passage of electric current through a conducting solution causes effect.
- LED glows even when a electric current passes through it.
- Most liquids that conduct electricity are solutions of , and
- When electric current is passed through acidified water, and are produced.

2. Name the following:

- The device which glows even when a weak current passes through it.
- Metal electroplated on car parts like bumpers.
- The polluting waste generated by electroplating factories.
- The most common application of chemical effect of electric current.
- A metal purified by using electrolysis.

B. Short Answer Type Questions

- Write the full form of LED.
- Vinegar is a sour liquid. State whether vinegar will conduct electricity or not.
- What effect does an electric current produce when flowing through a conducting liquid?
- Acidified water is electrolysed by using carbon electrodes. What is produced at: (a) positive carbon electrode? (b) Negative carbon electrode?
- Give one example of the chemical effect of electric current.
- Name the metal which is usually electroplated on car parts such as bumpers and bicycle handlebars made of steel.
- Which metal is electroplated on iron for making cans used for storing food?
- Name two metals which are usually electroplated on cheaper metals for making jewellery items.
- Why is it advantageous to use LED in testing electrical conductivity of liquids?
- Why is it dangerous to touch a working electrical appliance with wet hands?

12

Some Natural Phenomena

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Identify the 2 types of electric charges and their interactions.
- Outline the construction and working of an electroscope.
- Explain lightning, its dangers and safety measures to protect ourselves from it.
- Recognise how earthquakes occur and measured using seismograph.
- Explain how intensity of earthquakes is measured and list ways for minimizing its effects.

Textbook: Refer to pages 235 to 254

Periods allocated: 12 periods

VOCABULARY

Static electric charge, electroscope, earthing, electric discharge, lightning, sheet lightning, fork lightning, lightning conductor, earthquake, core, mantle, crust, seismic zone, seismograph, Richter scale.

ACTIVITIES FOR PERIODS 1 AND 2

Electric charge (Page 235)

Learning Tools

Interactive warm up exercise: Discussing with the students the natural phenomena lightning and earthquake would be a good start for the topic.

Chapter opening exercise: Students should be asked what happens when we rub a plastic comb with our dry hair and bring it near tiny pieces of paper. Ask students how are these tiny pieces of paper get attracted towards the comb.

Teacher guided discussion

Discuss with them that an object with no electric charge is called an uncharged object and an object having electric charge is called charged object. The charging of an object can be done by rubbing it

with another object and this is called charging by friction. The electric charges generated by rubbing are static electric charges. Students should know there are two types of electric charges: positive charge and negative charge. Like charges repel each other while unlike charges attract each other.

Using resources

- Conduct activities 1, 2, 3 and 4 given on page nos. 236 to 239 to explain the electric charges and their interaction.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

When a charged glass rod is brought near a charged plastic straw, there is attraction between the two. What is the nature of charge on the plastic straw?

NEP

Local Knowledge: The teacher can ask the students to give examples from day to day life of how objects gets charged.

ACTIVITIES FOR PERIOD 3 AND 4

Electroscope (Page 240)

Teacher guided discussion

Discuss with the students that the electroscope is a device for detecting electric charge on an object. Describe the construction and working of a simple electroscope to students in detail. Students should know how the charge on an object can be detected by using an electroscope. Explain that the process of transferring an electric charge from a charged object to the earth is called earthing. The passage of electric current in air due to the movement of electric charges is called electric discharge.

Suggested home assignment

Why is earthing provided in the wiring of houses and other buildings?

ACTIVITIES FOR PERIOD 5 AND 6

Lightning (Page 242)

Teacher guided discussion

Explain to the students that the bright flash of light which we see in the clouds is called lightning. The top of the cloud becomes positively charged while the bottom of the cloud becomes negatively charged. Students should be able to differentiate between sheet lightning and fork lightning. Students should be aware of the destructive effects of lightning. They should know that lightning conductor is a device used to protect buildings from the effects of lightning. Students should be able to list measures to protect themselves from lightning during a thunderstorm.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Give reasons:

1. Lightning strikes are more frequent in hilly areas than in plains.
2. When we take off woollen or synthetic clothes, sometimes we hear a crackling sound.

NEP

Experiential learning through outdoor activity: The teacher can ask the students to visit and observe lightning conductors in some tall buildings near their home and discuss about their importance in the class.

ACTIVITIES FOR PERIODS 7 AND 8

Earthquakes (Page 245)

Teacher guided discussion

Discuss with the students that an earthquake is a sudden shaking of the earth which lasts for a very short time. Make students aware that it is a destructive natural phenomenon which cannot be predicted in advance and may cause damage to houses other buildings, bridges, dam, people etc. It can also cause, floods, landslides and tsunamis. To make the topic elaborate, first explain the structure of earth in detail. Students should be able to know the composition of core, mantle and crust of earth. Explain that earthquakes occur when the moving plates of earth's crust slide past one another or collide with one another. The weak zones of earth's crust are called seismic zones. Seismograph is an instrument which measures and records the magnitude of an earthquake in terms of shock waves it produces. Describe the working of seismograph in detail to the students. Students should be able to define focus and epicentre. Tell them that the magnitude of an earthquake is expressed on the Richter scale. Students should know the precautions which can be taken by people living in seismic zones for protection against earthquakes.

Suggested home assignment

On the physical map of India, mark the seismic zones of India. What precautions will you suggest to the people living in seismic zones for protection against earthquakes?

NEP

21st Century Skills: The teacher can ask the students to explore internet and find out how seismic stations work as earthquake recording laboratories.

ACTIVITIES FOR PERIOD 9

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 10

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 11 AND 12

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following:-

- (a) Positive electric charge and negative electric charge (b) Negative electric charge
- (c) Electroscope (d) Lightning (e) Benjamin Franklin
- (f) Lightning conductor (g) Earthquake (h) Seismograph
- (i) Richter scale (j) Volcanic eruption and nuclear explosion

2. Fill in the following blanks with suitable words:-

- (a) repel; attract (b) positive (c) negative
- (d) electrons (e) friction (f) repel
- (g) Earthing (h) electric (i) plate

3. State whether the following statements are true or false :-

- (a) False (b) True (c) False (d) False (e) True
- (f) True (g) False

Subjective Type Questions

Short Answer Type Questions

1. When we rub the plastic comb with our dry hair, the plastic comb gets electric charge due to friction. The electrically charged comb then exerts an electric force on the tiny pieces of paper and attracts them.
2. The charging of a glass rod by rubbing it with a silk cloth is an example of charging by friction.
3. When the top end of metal clip of the electroscope is touched with the negatively charged plastic comb, even then the aluminium leaves of the electroscope diverge (or open up). In this case, the two aluminium leaves get negatively charged and hence repel each other. This repulsion causes the aluminium leaves to diverge.
4. If we touch the metal top of a charged electroscope with our finger, it gets discharged and its aluminium leaves collapse (or fold up). The process in which the metal top of a charged electroscope is touched with finger and its charge flows into earth through our hand and body is called earthing.
5.
 - (i) If on touching the metal top of electroscope with the given object, the aluminium leaves of the electroscope diverge (or open up), then the given object has an electric charge on it (or the given object is electrically charged).
 - (ii) If on touching the metal top of electroscope with the given object, the aluminium leaves of the electroscope do not diverge (do not open up), then the given object has no electric charge on it (or the given object is electrically uncharged).
6. When the two huge plates of earth's crust slide past one another, they rub against one another ferociously and the rocks on their edges get entangled. Due to entanglement of the rocks at their edges, the two crust plates stop moving for some time. During this time, the plates are still pushing against one another and trying to move *but they are not moving*

(due to entanglement of their rocky edges). This builds up pressure between the two plates of crust. When sufficient pressure has been built up between the two crust plates, the entangled rocks of two plates break open with a big jolt. When the entangled rocks of the two crust plates break open suddenly with a big jolt, the earthquake occurs releasing a tremendous amount of energy. This sudden release of tremendous amount of energy produces shock waves (or seismic waves) which make the earth shake.

7. We should avoid raising an umbrella over our head during lightning. This is because lightning may strike the top end of the metal rod of umbrella (held high over the head) and harm us.
8. When in open space, a person should never stand under a tree to take shelter during a thunderstorm because there is danger of lightning striking the tree and burning it up. This lightning can also pass through the body of the person standing under the tree and kill him. When in open space, a person should not lie on the ground during the thunderstorm and lightning. A person should squat low on the ground during lightning. The person should place his hands on his knees with his head between the hands. This position will make the person the shortest object around which is unlikely to be hit by lightning.
9. When we take off a woollen (or synthetic) sweater, it rubs against our shirt. The rubbing together of sweater and shirt produces opposite electric charges on them. The discharge of these electric charges produces tiny sparks of light as well as crackling sound.
10.
 - (a) A lightning conductor is made of a thick strip of metal (usually of copper).
 - (b) The top end of lightning conductor is pointed like a sharp spike (or spikes).
 - (c) It is fixed above the highest point of the building.
 - (d) The lower end of metal strip is joined to a metal plate and buried deep in the ground near the base of the building.
11.
 - (i) We should stay at a clear spot away from buildings, trees and over-head power lines, etc. We should also sit on the ground (so that we may not fall down due to shaking of ground).
 - (ii) If we are in a car (or bus), we should not come out of it. The car (or bus) should be driven slowly to a clear spot away from buildings, trees and over-head electric wires, etc. We should not come out of the vehicle till the tremors stop.
12. In highly seismic areas, the use of mud and timber (wood) for building houses is better than using heavy construction materials. The roofs of houses in such areas should be kept as light as possible so that in case a roof falls during an earthquake, the damage will not be too much. The cupboards and shelves should be fixed to the walls so that they do not fall easily when shaking occurs during an earthquake. Glass bottles should not be placed on high shelves and heavy objects should be placed low to the ground.

Long Answer Type Questions

1. The electroscope is a device for detecting electric charge on an object. Refer to Figure 6 for the diagram. Charge a glass rod by rubbing its one end with a piece of silk cloth. Touch the charged glass rod with the top end of metal clip. We will see that the two aluminium leaves move away from each other. We say that the aluminium leaves diverge (or open up). When we touch the top end of metal clip with the positively charged glass rod, then some of its positive charge is transferred to the top end of metal clip. Now, since the metal

clip is a good conductor of electricity, it conducts the positive electric charge to the two aluminium leaves held on its other end. In this way, the two aluminium leaves get charged with the same kind of electric charge—positive charge. We know that similar charges (or like charges) repel each other. So, the two aluminium leaves having similar charges (positive charges) repel each other due to which they move apart or diverge. Whether an object is positively charged or negatively charged, it will cause the aluminium leaves of the electroscope to diverge when touched with the metal top of the electroscope.

2. (a) A. The bright flash of light which we see in the clouds is called lightning. Lightning is an electric discharge in the atmosphere between oppositely charged clouds (or between charged cloud and the earth). Lightning is actually a great electric spark in the sky. Lightning is produced by the electric charges in the sky.
(b) In the planes, lightning usually strikes tall structures like tall buildings, factory chimneys, radio and TV transmission towers or big trees. This is because all these tall objects are closer to the charged clouds than the ground.
(c) When lightning strikes the earth, it can cause a lot of destruction by damaging property (buildings, etc.), trees and killing people.
3. (a) A lightning conductor is made of a thick strip of metal (usually of copper). The top end of lightning conductor is pointed like a sharp spike (or spikes) and it is fixed above the highest point of the building. From the top of the building, the thick metal strip runs along the outer wall of the building to the ground. The lower end of metal strip is joined to a metal plate and buried deep in the ground near the base of the building. If lightning strikes, it will hit the top of the lightning conductor rather than the building. The electric energy of lightning passes through the metal strip and gets discharged safely into the ground through the buried metal plate. Since no electric energy produced by lightning passes through the building, no damage is caused to it. Thus, lightning can be discharged harmlessly into the ground (or earth) through the lightning conductor fitted on tall buildings and other tall structures like factory chimneys, radio and TV transmission towers and monuments like Qutab Minar. We know that metals are good conductors of electric charges (or electricity). So, a lightning conductor made of a metal works by conducting the electric energy of lightning into the earth. We can see the lightning conductors fixed on many tall buildings, factory chimneys, etc. Lightning conductor was invented by Benjamin Franklin.
(b) Lightning strikes are more frequent in the hilly areas because in such areas clouds are comparatively closer to the ground than in the planes.
4. (a) An earthquake is a sudden shaking (or trembling) of the earth which lasts for a very short time. The earthquakes occur when the moving plates of the earth's crust : (i) slide past one another, and (ii) collide with one another.
(b) The place inside the earth's crust where the earthquake is generated is called 'focus' of the earthquake. The point on earth's surface directly above the focus is called epicentre.
(c) Earthquakes can cause immense damage to houses, other buildings, bridges, dams and people, etc. A lot of people get killed when they get buried under the debris of collapsed houses and other buildings during an earthquake. Earthquakes can also cause floods, landslides, and tsunamis.

5. The inside of earth is made up of three main layers: Core, Mantle and Crust. Refer to Figure 11 for diagram. Seismograph is an instrument which measures and records the magnitude of an earthquake in terms of the shock waves it produces. Refer to Figure 16 for diagram.

Competency-Based Questions

Multiple Choice Questions

- | | | | | |
|---------|---------|---------|--------|---------|
| 1. (b) | 2. (b) | 3. (d) | 4. (c) | 5. (d) |
| 6. (c) | 7. (d) | 8. (b) | 9. (a) | 10. (c) |
| 11. (c) | 12. (b) | 13. (a) | | |

Case Based Questions

1. Seismograph
2. The statement "epicentre was in Bhuj" means that the earthquake originated in or near the Bhuj, marking the point on the earth's surface directly above where the earthquake is felt the most.
3. Shivansh should just move on the bed to be close to a wall but not get up from the bed. He should protect his head with a pillow.
4. Houses made of timber and mud are usually preferred in earthquake-prone areas. Heavy construction materials should be avoided to minimise the damage.

Assertion-Reason Based Questions

1. (b) A and R both are correct, but R is not the correct explanation of A. The correct reason is, in case a roof falls during an earthquake, the damage will not be too much if the roof is light.
2. (a) Assertion and reason both are correct, and reason is the correct explanation of assertion.
3. (d) Lightning strikes are more frequent in the hilly areas because in hilly areas clouds are comparatively closer to the ground than in the plains.
4. (c) A is correct, but R is incorrect. Earthing is done to protect us from electric shocks which may occur due to any leakage of electric current.



21st Century Skills

1. A charged balloon repels another charged balloon because like charges repel ; A charged balloon attracts an uncharged balloon by producing opposite charges in the nearer end of uncharged balloon by electric induction.
2. A glass rod can be charged by rubbing when held in hand because glass rod is an insulator which does not conduct electric charges produced on its surface through our hand and body into the earth ; An iron rod cannot be charged by rubbing when held in hand because iron rod is a conductor due to which as soon as it gets charged by rubbing, the electric charges produced on its surface flow through our hand and body into the earth and it remains uncharged
3. (a) The aluminium leaves of the electroscope diverge (or open up)
(b) The aluminium leaves of the electroscope diverge (or open up)
4. (a) Yes (b) No

Name: Class: Date:

A. Objective Type Questions

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) Like charges each other.
- (b) Each fragment of earth's crust is called
- (c) Lightning is an spark.
- (d) Rubbing glass with silk makes a charge on the glass.
- (e) In an electroscope, the aluminium leaves

2. Name the following:

- (a) The kind of electric charge acquired by a plastic comb rubbed with dry hair.
- (b) The device used to detect electric charge on a body.
- (c) The scientist who showed that lightning is electric in nature.
- (d) The scale on which magnitude of an earthquake is expressed.
- (e) The type of charge acquired by a rubber balloon when rubbed with woollen cloth.

B. Short Answer Type Questions

1. A negatively charged object attracts another charged object placed near it. What is the nature of charge on the other object?
2. A positively charged object repels another charged object kept close to it. What is the nature of charge on the other object?
3. Name the device to detect electric charges on a body.
4. When an object is touched with the metal top of an electroscope, its aluminium leaves diverge. What conclusion do you get from this observation?
5. Why should a person not stand under a tree during a thunderstorm?
6. Name the device which is used to protect a tall building from lightning.
7. Name the instrument used to measure and record an earthquake.
8. For what purpose is Richter scale used?
9. How will you charge an inflated rubber balloon by the method of friction?
10. What will you observe when the metal top of an electroscope is touched with a plastic comb rubbed in dry hair? Give reason for your answer.

13

Light

Lesson Plan

Expected Learning Outcomes

The present chapter will help the students to imbibe the following concepts. The students will be able to:

- Recognize that light make things visible to us.
- List the examples of luminous and non-luminous objects.
- Define reflection of light & comprehend the laws governing it.
- Identify how regular and diffused reflection of light takes place.
- Explain the formation of image in a plane mirror.
- Illustrate the formation of multiple images and list its applications.
- Outline the structure and working of the human eye.
- Name the 3 common eye defects and explain how they can be corrected.
- Define what is Braille and explain its use for visually challenged people.

Textbook: Refer to pages 255 to 276

Periods allocated: 14 periods

VOCABULARY

Luminous object, non-luminous object, reflection, incident ray, reflected ray, normal, angle of incidence, angle of reflection, regular reflection, diffuse reflection, lateral inversion, periscope, kaleidoscope, rainbow, iris, retina, rods, cones, blind spot, persistence of vision, far point, near point, myopia, hypermetropia, cataract, Braille.

ACTIVITIES FOR PERIODS 1 AND 2

Reflection of light and laws of reflection of light (Page 256)

Learning Tools

Interactive warm up exercise: Discussing with the students light as a form of energy would be a good start for the topic. Ask students about the importance of light.

Chapter opening exercise: Students should be asked the difference between luminous objects and non-luminous objects.

Teacher guided discussion

Discuss with the students that the process of sending back light rays which fall on the surface of an object is called the reflection of light. Students should be able to define the terms incident ray, reflected ray, normal, angle of incidence and angle of reflection. Explain the two laws of reflection of light with the help of examples.

Using resources

- Conduct the activity given on page no. 256 to study the reflection of light from a plane mirror.
- Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

State the two laws of reflection of light.

NEP

Experiential learning through indoor activity: The teacher can ask the students to lit a torch at different angles towards a firmly placed plane mirror.

They are asked to obtain the reflected light on a thick cardboard sheet and observe whether incident light, reflected light and normal towards the mirror lies on the same plane or not.

They are also asked to check if the angle of incidence is equal to the angle of reflection in all the cases or not.

ACTIVITIES FOR PERIOD 3 AND 4

Regular reflection and diffuse reflection of light (Page 260)

Teacher guided discussion

Discuss with them that in regular reflection, a parallel beam of incident light is reflected as a parallel beam in one direction. It occurs on smooth surfaces like plane mirrors. In diffuse reflection, a parallel beam of incident light is reflected in different directions. It takes place from rough surfaces like paper, cardboard, etc.

Suggested home assignment

Explain the regular and diffuse reflection with the help of ray diagrams.

ACTIVITIES FOR PERIOD 5 AND 6

Formation of image by a plane mirror (Page 261)

Teacher guided discussion

Explain how the formation of image takes place in a plane mirror to the students. Students should know the characteristics of the image formed in a plane mirror: - it is virtual, behind the mirror, at

the same distance behind the mirror as the object is in front of it, of the same size as the object, erect and laterally inverted. Students should be able to define lateral inversion.

Suggested home assignment

Describe the characteristics of the image formed by a plane mirror.

ACTIVITIES FOR PERIOD 7 AND 8

Reflected light can be reflected again (Page 262)

Teacher guided discussion

Explain them that an optical instrument in which reflected light is reflected again is the periscope. Discuss the construction and working of a periscope. Students should know the uses of periscopes. Discuss that when two plane mirrors are kept inclined at an angle, they can form multiple images of an object. Two plane mirrors arranged at right angles to each other form three images of an object placed between them. The kaleidoscope is an instrument containing inclined plane mirrors which produce multiple reflections of colored glass pieces and create beautiful patterns. Explain the construction and working of kaleidoscope in detail to the students. Discuss that the splitting of white light into seven colors on passing through a glass prism is called dispersion of light. Explain the formation of rainbow as a natural phenomenon showing dispersion of light.

Suggested home assignment

How does the formation of rainbow take place?

NEP

Experiential learning through outdoor activity: The teacher can ask the students to visit a nearby optician and ask about various kinds of lenses he or she uses to make eye glasses.

ACTIVITIES FOR PERIODS 9 AND 10

The human eye (Page 266)

Teacher guided discussion

Explain the structure and working of human eye in detail to the students with the help of a chart showing the internal structure of human eye. Discuss the function of iris in controlling the amount of light by adjusting the size of pupil. The retina has a large number of light sensitive cells: rods (sensitive to dim light) and cones (sensitive to bright/normal light). Blind spot is a small area of retina insensitive to light where the optic nerve leaves the eye. Explain that the ability of an eye to continue to see the image of an object for a very short duration even after the object has disappeared from view is called persistence of vision. The range of vision of a normal human eye is from infinity to about 25 centimeters. Defects of eye like myopia, hypermetropia and cataract should be discussed in detail and the ways to correct them should be familiarized to the students. They should realize to take care of their eyes by protecting them and eating healthy. Discuss the eyes of other animals to make the topic interesting. Explain that Braille is a written language for the visually challenged persons in which characters are represented by patterns by patterns of raised dots.

Using resources

Students may run the video for the given topic using the QR Code given at the end of the chapter on the Study Gear app.

Suggested home assignment

Draw a well labelled diagram of human eye. Explain the working of the eye.

NEP

21st Century skills: The teacher can ask the students to explore internet and find out how visually challenged people sense letters and characters written on a page.

ACTIVITIES FOR PERIOD 11

Revise all the topics covered in the previous lessons.

Using resources

Refer to the corresponding chapter in the Digital Support given in the book.

ACTIVITIES FOR PERIOD 12

Discuss the exercises given at the end of the chapter.

ACTIVITIES FOR PERIOD 13 AND 14

Assessment of understanding of the chapter could be done with the help of the given worksheet for the chapter.

TEXTBOOK ANSWERS

Objective Type Questions

1. Name the following :-

- | | | | |
|------------------------|-----|------------------------|-------------------------|
| (a) Ray box | (b) | (i) Diffuse reflection | (ii) Regular reflection |
| (c) Regular reflection | (d) | Virtual | (e) Lateral Inversion |
| (f) Periscope | (g) | A glass prism | (h) Convex lens |
| (i) Blind spot | (j) | Persistence of vision | (k) Night blindness |
| (l) Kaleidoscope | | | |

2. Fill in the following blanks with suitable words:

- | | | | |
|---------------|----------|----------------------|-----------|
| (a) incidence | (b) 2 | (c) left ; left hand | (d) large |
| (e) fewer | (f) 1/16 | (g) 16 | (h) 24 |

3. State whether the following statements are true or false :-

- | | | | | |
|-----------|-----------|----------|----------|-----------|
| (a) True | (b) False | (c) True | (d) True | (e) False |
| (f) False | (g) True | | | |

Subjective Type Questions

Short Answer Type Questions

1. We need a source of light to make the objects (or things) visible. a. In this case, the wooden screen acts a opaque screen and does not allow the light from the book to enter our eyes. b. In this case, light is not reflected from the book in our eyes because the room is dark.

2. Regular reflection of light and diffuse reflection of light are the two types of reflection of light. The wall produces diffuse reflection of light while the mirror produces regular reflection of light. In diffuse reflection, a parallel beam of incident light is reflected in different directions. In regular reflection, a parallel beam of incident light is reflected as a parallel beam in one direction.
3. Angle of incidence and angle of reflection respectively. The angle of reflection is always equal to the angle of incidence.
4. (i) The image formed by a plane mirror is virtual (or unreal).
(ii) The image formed by a plane mirror is behind the mirror.
5. An optical instrument (or device) in which reflected light is reflected again is a periscope. A periscope is a long, tubular device through which a person can see objects that are out of the direct line of sight. A periscope works on the reflection of light from two plane mirrors arranged parallel to one another.
6. (a) 2 (b) 7 (c) 1 (d) 5 (e) 3
7. Infinite number of images
8. Take a glass prism and place it on a table in a darkened room. Place a white cardboard screen at some distance behind the prism. Allow a thin beam of sunlight (coming through a tiny hole in the window) to fall on the prism. We will see that the beam of white sunlight splits on entering the glass prism and forms a broad patch of seven colors (called spectrum) on the white screen placed on the other side of prism.
9. The splitting up of white light into seven colors on passing through a transparent medium like a glass prism is called dispersion of light. Rainbow in the sky is a natural phenomenon showing the dispersion of sunlight.
10. The kaleidoscope consists of three long and narrow strips of plane mirrors inclined at 60° to one another forming a hollow prism, and fitted into a cardboard tube.
11. We can see an object when light reflected by that object reaches our eyes. In the dark room, there is no light. Hence no light is reflected by the object and we are unable to see anything. However, light is present outside the room, and on being reflected from the objects we can see them.
12. The eye-lens is a flexible convex lens whose thickness and hence focal length (or converging power) can be changed by the action of Ciliary muscles. On the other hand, a glass convex lens has a fixed thickness due to which its focal length (or converging power) is also fixed, and cannot be changed.
13. Myopia is that defect of eye (or defect of vision) due to which a person cannot see the distant objects clearly (though he can see the nearby objects clearly). Myopia is corrected by using spectacles containing concave lenses (diverging lenses) of suitable power.
14. The ability of an eye to continue to see the image of an object for a very short duration even after the object has disappeared from view, is called persistence of vision. It is due to the phenomenon of persistence of vision that we are able to see movie pictures in a cinema hall.

- 15.** In an image formed by a plane mirror, the left side of object appears on the right side in the image whereas the right side of object appears on the left side in the image. This change of sides of an object and its mirror image is called lateral inversion. For example, if we stand in front of a plane mirror (like the one on a dressing table) and lift our left hand, then our image in the plane mirror appears to lift its right hand. And if we lift our right hand, then our image in the plane mirror appears to lift its left hand. This means that the left side of our body becomes the right side in the mirror image whereas the right side of our body becomes left side in the mirror image. We say that our image in the plane mirror is laterally inverted (or sideways reversed). The change in the sides of an object and its mirror image is due to the phenomenon of lateral inversion.

Long Answer Type Questions

- 1.** (a) The objects which emit their own light are called luminous objects. The luminous objects are, in fact, the sources of light. Luminous objects produce their own light and then emit this light. The sun, other stars, lighted electric bulb, glowing tube-light, torch, fire, and flame of a burning candle, are all luminous objects.
(b) All the objects cannot give out their own light. The objects which do not emit their own light are called non-luminous objects. Actually, the non-luminous objects cannot make their own light. Since non-luminous objects cannot produce light, therefore, they cannot emit their own light. The moon, earth, other planets, table, chair, book, trees, plants, flowers, human beings, fan, bed, mirror, diamond, walls, floor and roads, are some of the examples of non-luminous objects.
- 2.** (a) In regular reflection, a parallel beam of incident light is reflected as a parallel beam in one direction. In this case, parallel incident rays remain parallel even after reflection and go only in one direction. Regular reflection of light occurs from smooth surfaces like that of a plane mirror (or highly polished metal surfaces). For example, when a parallel beam of light falls on the smooth surface of a plane mirror, it is reflected as a parallel beam in only one direction. Thus, a plane mirror produces regular reflection of light. Images are formed by regular reflection of light. In diffuse reflection, a parallel beam of incident light is reflected in different directions. In this case, the parallel incident rays do not remain parallel after reflection, they are scattered in different directions. The diffuse reflection is also known as irregular reflection or scattering. The diffuse reflection of light takes place from rough surfaces like that of paper, cardboard, chalk, table, chair, walls and unpolished metal objects. For example, when a parallel beam of light rays falls on the rough surface of a sheet of paper, the light is scattered by making reflected rays in different directions. Thus, a sheet of paper produces diffuse reflection of light. No image is formed in diffuse reflection of light.
(b) Refer to figures 9 and 10 respectively.
(c) Regular reflection: i, iv, vi Diffuse reflection: ii, iii, v
- 3.** (a) Refer to figure 2 for the diagram.
(b) According to the first law of reflection: The incident ray, the reflected ray, and the normal (at the point of incidence), all lie in the same plane. According to the second law of reflection: The angle of reflection is always equal to the angle of incidence.

4. (a) Refer to the figure 16 for the diagram.
- (b) Function of the given parts of the eye are as follows:
- Iris- The iris automatically adjusts the size of pupil according to the intensity of light received by the eye from the surroundings.
 - Eye lens- The eye-lens is a convex lens, so it converges the light rays and produces a real and inverted image of the object on the retina.
 - Ciliary muscles- The Ciliary muscles can change the curvature of eye-lens and make it thin or thick according to the need of the eye.
 - Retina- The retina is a screen on which the image is formed in the eye.
 - Optic nerve- The optic nerve carries the image formed on retina to the brain in the form of electrical signals.

Competency-Based Questions

Multiple Choice Questions

1. (a) 2. (b) 3. (c) 4. (d) 5. (a)
6. (c) 7. (c) 8. (d) 9. (b) 10. (b)

Case Based Questions

1. Myopia
2. It is corrected by using spectacles containing concave lens (diverging lens) of suitable power.
3. The image of distant object is formed on the retina with the help of concave lens and hence can be seen clearly.

Assertion-Reason Based Questions

1. (c) A is correct but R is incorrect. When we go from a bright light to a dark room, at first, we cannot see our surroundings clearly because in bright sunlight the pupil of our eye is small and when we enter dark room, it expands after some time, so that more light can enter.
2. (d) When an object is placed between two parallel plane mirrors facing each other, then only a limited number of images are seen. This is because some light is absorbed by the mirrors at each successive reflection due to which many images formed are so faint that they cannot be seen.
3. (a) Assertion and reason both are correct and reason is the correct explanation of assertion.
4. (c) Assertion and reason both are correct but reason is not the correct explanation of assertion. We can see glowing tube light because the light given out by the tube light enters our eyes.



21st Century Skills

1. 7.5 m towards the mirror.
2. X : Persistence of vision ; Y : 1/16 second ; Z : Pictures
3. P : Kaleidoscope; Q: Periscope

WORKSHEET– CLASS 8, CHAP. 13 LIGHT

Name: Class: Date:

A. Objective Type Questions

- The angle between an incident ray and the plane mirror is 30° . The total angle between the incident ray and the reflected ray will be:
(a) 30° (b) 60° (c) 90° (d) 120°
 - A device which works on the refection of light from two plane mirrors arranged parallel to one another is:
(a) Electroscope (b) Kaleiodoscope
(c) Periscope (d) Stethoscope
 - The number of images formed of an object placed between two plane mirrors inclined at right angles to each other is:
(a) Two (b) Five (c) One (d) Three
 - As the angle between two plane mirrors is decreased gradually, the number of images of an object placed between them:
(a) Increases gradually (b) Decreases gradually
(c) First increases then decreases (d) First decreases then increases
 - How does the eye change in order to focus on near or distant objects?
(a) The lens moves in or out. (b) The retina moves in or out.
(c) The lens becomes thicker or thinner (d) The pupil becomes larger or smaller.
 - Which of the following is not a part of the human eye?
(a) Retina (b) Auditory nerve
(c) Optic nerve (d) Ciliary muscle
 - An incident ray makes an angle of 65° with the surface of a plane mirror. The angle of reflection in this case will be:
(a) 65° (b) 45° (c) 25° (d) 35°
 - The human eye forms the image of an object at its:
(a) Cornea (b) Iris (c) Pupil (d) Retina
 - The change in converging power of an eye-lens is caused by the action of:
(a) Iris (b) Ciliary muscles
(c) Optic nerve (d) Retina
 - The size of the pupil of the eye is adjusted by:
(a) Cornea (b) Ciliary muscles
(c) Optic nerve (d) Iris

Remarks

Teacher's signature

Name: Class: Date:

A. Objective Type Questions

1. Fill in the blanks:

- (a) The size of pupil becomes when you see in dim light.
- (b) Night birds have cones than rods in their eyes.
- (c) The angle of incidence equal to the angle of
- (d) In a, a pattern seen once can never be seen again.
- (e) The image of the object persists on the retina of the eye for about second even after the object has disappeared.

2. Name the following:

- (a) The apparatus used to obtain a thin beam of light.
- (b) The device which works on the reflection of reflected light.
- (c) The device used to split white light into seven colors.
- (d) The instrument which works by producing multiple images from three plane mirrors.
- (e) The name of the small opening in the iris of an eye.

B. Short Answer Type Questions

1. Define:

- (a) Incident ray (b) Reflected ray (c) Angle of incidence (d) Angle of reflection

2. A ray of light is incident normally (perpendicularly) on a plane mirror. Where will this ray of light go after reflection from the mirror?

3. What type of reflection of light takes place from:

- (a) a rough surface? (b) a smooth surface?

4. Name the device used to split white light into seven colours.

5. What happens to the size of the pupil of our eye in bright light?

6. We can see the sun because it is glowing. How are we able to see the moon?

7. What is a periscope? How many mirrors are there in a periscope? State the various uses of a periscope.

8. Explain why, when an object is placed between two plane mirrors inclined at an angle, then multiple images are formed.

9. What is meant by 'dispersion of light'? Name a natural phenomenon which is caused by the dispersion of sunlight in the sky.

10. Explain why, we cannot see our surroundings clearly when we enter a darkened cinema hall from bright sunshine but our vision improves after some time.

ANSWERS TO WORKSHEETS AND SAMPLE PAPERS

WORKSHEET– CLASS 8, CHAP. 1 CROP PRODUCTION AND MANAGEMENT

A. Objective Type Questions

- | | |
|-------------------------|-----------------------------|
| 1. (b) Pea | 2. (b) Mustard |
| 3. (d) Sowing the seeds | 4. (d) Transplantation |
| 5. (c) Nitrogen | 6. (c) Meat as well as eggs |
| 7. (d) Drip system | |

SAMPLE PAPER – CLASS 8, CHAP. 1 CROP PRODUCTION AND MANAGEMENT

A. Objective Type Questions

1. Fill in the blanks:

2. Name the following:

- (a) crop rotation
 - (b) protein
 - (c) Goat
 - (d) seed drill
 - (e) harvesting

B. Short Answer Type Questions

The advantages of sprinkler system are:

- The sprinkler system of irrigation is more useful for uneven land where sufficient water is not available.
- The sprinkler system is also very useful for sandy soil.

6. In the drip irrigation system, there is a network of narrow pipes (or tubes) with small holes, in the fields. When water flows through the narrow pipes, it falls drop by drop at the position of the roots of the plants. The drip system is the best technique for watering fruit plants

The drip irrigation system has the following advantages:

- The drip system provides water to plants drop by drop. So, water is not wasted at all.
- It is very useful in those regions where the availability of water is poor.

7. Wheat is a rabi season crop. If wheat is sown in the kharif season, it will not grow well. This is because wheat plants cannot tolerate too much water during the rainy season.

8. Kharif crops are: Paddy, Maize, Soyabean, Groundnut and Cotton.

The Rabi crops are: Wheat, Gram, Peas, Mustard, and Linseed.

9. The process of loosening and turning the soil is called ploughing (or tilling). Two implements used to plough fields are a plough and a cultivator.

10. Manure is a natural substance obtained by the decomposition of animal wastes like cow dung, human wastes, and plant residues, which supply humus to the soil.

The advantages of manure are:

- It improves the physical and chemical properties of the soil.
- Manure also improves the soil texture for better retention of water and aeration

WORKSHEET – CLASS 8, CHAP. 2 MICRO-ORGANISMS: FRIEND AND FOE

A. Objective Type Questions

1. (c) Growth of yeast cells
2. (b) Edward Jenner
3. (d) Measles
4. (c) A fungus
5. (c) Cholera
6. (c) Malaria
7. (d) pasteurisation
8. (d) all of these

SAMPLE PAPER – CLASS 8, CHAP. 2 MICRO-ORGANISMS: FRIEND AND FOE

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|--------------|------------------|
| (a) Nitrogen | (b) communicable |
| (c) bacteria | (d) common salt |
| (e) milk | |

2. Name the following:

- | | |
|----------------------|----------------|
| (a) microscope | (b) cholera |
| (c) blue-green algae | (d) Penicillin |
| (e) Edward Jenner | |

B. Short Answer Type Questions

1. Microscope
2. (a) **Bacteria:** cholera and typhoid
(b) **Viruses:** common cold and influenza
(c) **Protozoa:** dysentery and malaria
(d) **Fungi:** ringworm and athlete's foot.
3. When a housefly sits on garbage, excreta, or filth, millions of disease-causing micro-organisms stick to its hairy legs and body. When the housefly later sits on uncovered food, these micro-organisms are transferred to the food. This can lead to the spread of diseases. The spreading of diseases by houseflies can be prevented in the following ways:
 - The food should always be kept covered so that flies cannot sit on it.
 - The flies should be killed by using insecticide spray and baits.
4. The process of conversion of sugar into alcohol by the action of yeast is called fermentation. Fermentation was discovered by Louis Pasteur in 1857.
5. Antibiotics cannot be used to cure diseases like the common cold and flu because these are caused by viruses.
6. HIV stands for 'Human Immunodeficiency Virus'. HIV causes AIDS disease. AIDS stands for Acquired Immune Deficiency Syndrome.

7. The disease caused due to the presence of a large number of microorganisms (such as bacteria and fungi) or toxic substances in food is called food poisoning. It is caused due to the consumption of food spoilt by some micro-organisms.
8. The process in which the food materials are given a suitable physical or chemical treatment to prevent their spoilage is called food preservation. Some of the methods for preserving foods are: (i) Sun-drying (or Dehydration) (ii) Heating (iii) Cooling (or Refrigeration) (iv) Deep freezing (v) Addition of common salt.
9. The method of pasteurisation is used for the preservation of milk in big milk dairies, and it involves the process of heating, followed by quick cooling. Milk is preserved by the method of pasteurisation as follows: First, the milk is heated to about 70°C for 15 to 30 seconds to kill most of the bacteria present in it. Next, this hot milk is cooled very quickly to a low temperature to prevent any remaining bacteria from growing further. And then this milk is stored in cold (in refrigerators).
10. (a) Female Aedes mosquito: dengue
(b) Female Anopheles mosquito: malaria

WORKSHEET – CLASS 8, CHAP. 3 COAL AND PETROLEUM

A. Objective Type Questions

- | | |
|--------------------|------------------|
| 1. (c) Butane | 2. (b) Methane |
| 3. (b) Natural gas | 4. (c) Petroleum |
| 5. (c) Coke | 6. (d) Hydrogen |
| 7. (c) Wildlife | 8. (a) Coke |

SAMPLE PAPER – CLASS 8, CHAP. 3 COAL AND PETROLEUM

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|---|--------------|
| (a) Carbon | (b) Refining |
| (c) Petroleum Conservation Research Association | |
| (d) CNG | (e) Kerosene |

2. Name the following:

- | | |
|-----------------|--------------|
| (a) Coke | (b) Coal tar |
| (c) Natural gas | (d) Bihar |
| (e) Bitumen | |

B. Short Answer Type Questions

1. (a) **LPG:** Liquefied Petroleum Gas

(b) **CNG:** Compressed Natural Gas.

2. When heated in the air, coal burns and produces mainly carbon dioxide gas. A lot of heat energy is also produced during the burning of coal.

3. Uses of Coal:

- Coal is used as a fuel in homes and industry.
- Coal is used as a fuel at Thermal Power Plants for generating electricity.

Uses of coke:

- Coke is used in the manufacture of steel.
- Coke is also used as a fuel.

4. Coal gas is a gaseous fuel which is obtained by the strong heating of coal in the absence of air during the processing of coal to get coke. Coal gas is used as a fuel in industries (which are situated near the coal processing plants).

5. The refining of petroleum gives the fractions (or products) such as petroleum gas, petrol, kerosene, diesel, lubricating oil, paraffin wax and bitumen.

The important uses of the various fractions of petroleum are given below.

- **PETROLEUM GAS.** Petroleum gas is used as a fuel in homes and industry. Petroleum gas is used as a fuel as such or in the form of Liquefied Petroleum Gas (LPG).

- PETROL. Petrol is used as a fuel in light motor vehicles (such as cars, motorcycles, and scooters, etc.).
 - KEROSENE. Kerosene is used as a fuel in wick stoves and pressure stoves to cook food.
 - DIESEL. Diesel is used as a fuel in heavy motor vehicles (such as buses, trucks, tractors, and diesel train engines).
 - LUBRICATING OIL. Lubricating oil is used for lubrication in machines and engines (like car engines).
 - PARAFFIN WAX. Paraffin wax is used for making candles, vaseline, ointments, wax paper, and grease.
 - BITUMEN. Bitumen is used for road surfacing. It is also used for water-proofing the roofs of buildings. Bitumen is used in making black paints.
6. Natural gas occurs deep under the crust of the earth either alone or along with oil above the petroleum deposits. Natural gas is called a clean fuel because it burns without producing any smoke and does not cause air pollution.
7. **Liquefied petroleum gas (LPG) is a good fuel because of its following advantages:**
- It burns easily.
 - It has a high calorific value. Due to this, a given amount of LPG produces a lot of heat. It burns with a smokeless flame and hence does not cause air pollution.
 - It does not produce any poisonous gases on burning.
 - It does not leave behind any solid residue on burning.
8. Petroleum is a dark coloured, thick crude oil found deep below the ground in certain areas. It is found under the crust of earth trapped in rocks.
9. Those chemicals which are obtained from petroleum and natural gas are called petrochemicals. Some examples of petrochemicals are: methyl alcohol and ethyl alcohol.

WORKSHEET– CLASS 8, CHAP. 4 COMBUSTION AND FLAME

A. Objective Type Questions

1. (c) Hottest part
2. (a) Woollen blanket should be used to cover the burning clothes
3. (c) Carbon dioxide
4. (b) Biogas
5. (c) Coke
6. (a) Carbon monoxide
7. (b) It is lighter than air
8. (d) White phosphorus
9. (b) White phosphorus
10. (a) Spirit

SAMPLE PAPER – CLASS 8, CHAP. 4 COMBUSTION AND FLAME

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|---------------|--------------------------|
| (a) water | (b) ignition temperature |
| (c) LPG | (d) flame |
| (e) pollution | |

2. Name the following:

- | | |
|---------------------|------------|
| (a) kJ/kg | (b) CNG |
| (c) carbon monoxide | (d) petrol |
| (e) coke | |

B. Short Answer Type Questions

1. Give reasons for the following:

- (a) The green leaves contain a lot of water. This water does not allow the green leaves to get heated to their ignition temperature easily and makes the burning of green leaves difficult. On the other hand, since dry leaves do not contain water, they get heated to their ignition temperature easily and hence catch fire easily.
- (b) The candle stops burning (or gets extinguished) because the supply of fresh air to the burning candle is cut off by the gas jar cover.
- (c) LPG has a much higher calorific value than wood, so it produces much more heat on burning than an equal mass of wood. LPG burns without producing any smoke but burning of wood produces a lot of smoke. LPG burns completely without leaving behind any solid residue but wood leaves behind a lot of ash on burning.

2. Distinguish between:

(a)	Spontaneous Combustion	Explosive Combustion
	Occurs on its own (without the help of any external heat).	A very fast combustion reaction in which a large amount of heat, light and sound are produced.
	The burning of white phosphorus on its own at room temperature is an example of spontaneous combustion.	The fireworks (crackers, etc.) which we explode during festivals work on the explosive combustion of substances.
(b)	Combustible substances	Non-combustible substances
	Those substances which can undergo combustion.	Those substances which do not undergo combustion.
	Examples: Paper, Cloth (Fabrics), Straw (Dry grass), Cooking gas (LPG), Wood, Charcoal, Coal, etc.	Examples: Stone, Glass, Cement, Bricks, Soil, Sand, Water, Iron nails, etc.

3. Explain how:

- The burning oil fire (petrol) can be extinguished by covering the pan with a fire blanket or a damp cloth. The supply of air to the burning oil (petrol) is cut off and hence the fire gets extinguished.
- The electrical fires are extinguished by using a carbon dioxide gas fire extinguisher. The carbon dioxide layer covers the fire like a blanket due to which fresh air cannot reach the burning substances. The burning substance does not get oxygen of the air and hence stops burning.
- Water extinguishes fire by cooling the burning substances. When water is thrown on a burning substance, it gets cooled below its ignition temperature and stops burning.

4. Give two examples of:

- Examples of solid fuels are:** Wood, Charcoal
- Examples of liquid fuels are:** Kerosene, Petrol
- Examples of gaseous fuels are:** Natural gas, Petroleum gas

WORKSHEET – CLASS 8, CHAP. 5 CONSERVATION OF PLANTS AND ANIMALS

A. Objective Type Questions

- | | |
|--------------------------------|----------------------|
| 1. (a) Asiatic lion | 2. (c) Snakes |
| 3. (d) Decrease in floods | 4. (c) Snakes |
| 5. (b) Their skin is expensive | 6. (c) Deforestation |
| 7. (b) buffer zone | 8. (a) endemic |

SAMPLE PAPER – CLASS 8, CHAP. 5 CONSERVATION OF PLANTS AND ANIMALS

A. Objective Type Questions

1. Fill in the blanks:

2. Name the following:

- (a) Satpura National Park
 - (b) Red Data Book
 - (c) Sultanpur Lake Bird Sanctuary (Haryana) and Thattekad Bird Sanctuary (Kerala)
 - (d) Corbett National Park (Uttarakhand) and Kanha National Park (Madhya Pradesh)
 - (e) Great Nicobar Biosphere Reserve (Andaman and Nicobar) and Kaziranga Biosphere Reserve (Assam)

B. Short Answer Type Questions

1.	Wildlife Sanctuary	Zoo
	In a Wildlife Sanctuary, the wild animals and birds live in their natural habitat in the forest.	In a Zoo, the wild animals and birds live in artificial settings such as cages and enclosures
	A Wildlife Sanctuary is not open to the public freely like a zoo. The public can visit a Wildlife Sanctuary only when accompanied by forest guards.	A Zoo is open to the public for a fixed time everyday.

2. The process by which fertile land becomes desert is called desertification. Deforestation and poor irrigation are the causes of desertification.
 3. The gradual increase in the overall temperature of the earth's atmosphere due to the greenhouse effect caused by the increased level of carbon dioxide in the atmosphere is called global warming.
 4. (a) Biodiversity refers to the variety of organisms (plants, animals micro-organisms, etc.) found in a particular area or habitat.

- (b) An ecosystem is a 'system' which includes all the living organisms (plants, animals and micro-organisms) of an area and the physical environment (soil, air and water) in which they live.
- (c) A Wildlife Sanctuary is a protected area of land which is created for the protection of wild animals in their natural environment like forests (in which no hunting is permitted).
- (d) Endemic species are those species (of plants and animals) which are found exclusively in a 'particular area'.
- (e) A National Park is a relatively large area of scenic beauty protected and maintained by the Government to preserve flora and fauna (plants and animals), landscape, historic objects of the area and places of scientific interest.
- (f) A Biosphere Reserve is a large, protected area of land meant for the conservation of wildlife, biodiversity, and the traditional lifestyle of the tribal people living in the area.

5. (a)

Wildlife sanctuary	National park
A Wildlife Sanctuary protects and preserves the wild animals in their natural environment.	A National Park protects and preserves wild animals and their environment as well as the scenic beauty, historical objects and habitats of scientific interest in the area
A Wildlife Sanctuary is not meant for recreation and enjoyment of the public. It is dedicated to the protection of wild animals only.	In a National Park, in addition to protection, wild animals are kept for the recreation, enjoyment and educative interests of the public.

(b)

Endangered species	Extinct species
The species which no longer exist anywhere on the earth are called extinct species	The species which are facing the risk of extinction are called endangered species
Some of examples of extinct species of animals are: Dinosaur, Dodo, Cave lion, Caspian tiger, and Irish deer.	Some examples of endangered animal species are: Tiger, Snow leopard, Great Indian rhinoceros, and Asiatic lion.

- 6. Project Tiger is a wildlife conservation project which was launched by the Government of India in 1972 to protect the tigers in the country. The objective of this project was to ensure the survival and maintenance of the tiger population in specially constituted 'Tiger Reserves' throughout India.
- 7. The Forest Conservation Act is aimed at the preservation and conservation of natural forests and at the same time meeting the basic needs of the people living in or near the forests.
- 8. When winter sets in Siberia and it gets extremely cold, the Siberian crane flies thousands of kilometres and comes to warmer places in India such as Bharatpur in Rajasthan, Sultanpur in Haryana, some wet lands of North-East, and some other parts of India.

WORKSHEET– CLASS 8, CHAP. 6 REPRODUCTION IN ANIMALS

A. Objective Type Questions

1. (b) Both similarities and variations with parents
2. (b) Formation of sperms
3. (c) Scrotal sacs
4. (b) Cloning
5. (c) Rat
6. (d) Fish
7. (c) Lizard
8. (a) Zygote
9. (a) Metamorphosis
10. (a) In female body

SAMPLE PAPER – CLASS 8, CHAP. 6 REPRODUCTION IN ANIMALS

A. Objective Type Questions

1. Fill in the blanks:
(a) cloning (b) tadpole (c) oviparous (d) ovum (e) fertilisation
2. Name the following:
(a) gametes (b) testes (c) uterus (d) eggs
(e) internal fertilisation

B. Short Answer Type Questions

1. The full form of IVF is ‘in vitro fertilisation’ technique. The success rate of this technique is only about 30 to 40 per cent.
2. (a) Testes in a man produce sperm.
(b) Ovary in a woman produces eggs or ova.
3. uterus
4. embryo

5. (a)	Zygote	Embryo	Foetus
	A zygote is formed by the fusion of male and female gametes (sperm and egg)	An embryo is formed by the repeated cell division of a zygote.	A foetus is formed by the growth and development of an embryo.
	A zygote is the beginning of the formation of a baby.	An embryo is an unborn baby in the uterus in the early stages of development (up to 8 weeks)	A foetus is an unborn baby in the uterus in the later stages of development (after 8 weeks till birth).

(b)

Internal fertilisation	External fertilisation
Fertilisation takes place inside the female body.	Fertilisation takes place outside the female body.
Examples: humans, cows, dogs, cats, tigers, lions, rabbit, etc.	Examples: frogs and most fishes.

6. After 8 weeks till birth, a human embryo is said to become a foetus.
7. Gametes are sex cells. Gametes are involved in sexual reproduction. Two gametes fuse to form a zygote. The act of fusion of gametes is called fertilisation.
8. Cloning is the production of an exact copy of an animal by means of asexual reproduction. Gametes (sperm and egg cells) are not involved in cloning. Two clones are Dolly sheep and Royana.
9. The production of a new organism from a single parent without the involvement of sex cells (or gametes) is called asexual reproduction. Some of the examples of asexual reproduction are: binary fission in Amoeba; and budding in Hydra.

WORKSHEET- CLASS 8, CHAP. 7 REACHING THE AGE OF ADOLESCENCE

A. Objective Type Questions

1. (b) Chapati, dal, vegetables
 2. (b) Virus
 3. (b) Pituitary
 4. (c) (ii) and (iii)
 5. (c) His blood sugar was high
 6. (c) Adolescent
 7. (c) Sweat

SAMPLE PAPER – CLASS 8, CHAP. 7 REACHING THE AGE OF ADOLESCENCE

A. Objective Type Questions

1. Fill in the blanks:

2. Name the following:

B. Short Answer Type Questions

1. Boys develop broader shoulders and wider chests than girls. Girls develop broader hips than boys. Due to this, the region below the waist becomes wider in girls.
 2. Sebum is secreted by sebaceous glands.
 3. Sebaceous glands and sweat glands
 4. Testes and ovaries
 5. The testes make male sex hormone called testosterone. The ovaries make female sex hormones called estrogen.
 6. (a) **In females (girls):** estrogen
(b) **In males (boys):** testosterone
 7. Testosterone hormone produces male secondary sexual characteristics in boys at puberty (such as a deeper voice; growth of facial hair like a moustache and beard; broad shoulders and chest; Adam's Apple; and more muscles).
 8. The pituitary gland controls the production of sex hormones.
 9. Menstruation is a process in which the thickened uterus lining along with its blood vessels is removed from the body of a woman through vaginal bleeding.

WORKSHEET– CLASS 8, CHAP. 8 FORCE AND PRESSURE

A. Objective Type Questions

1. (b) An apple falling from a tree
2. (d) Atmospheric pressure
3. (d) Gravitational force
4. (c) Newton
5. (c) 76 cm tall column of mercury
6. (c) 100 cm^2

SAMPLE PAPER – CLASS 8, CHAP. 8 FORCE AND PRESSURE

A. Objective Type Questions

1. Fill in the blanks:

- (a) push; pull
- (b) decreases
- (c) increases
- (d) atmospheric
- (e) interaction

2. Name the following:

- (a) Newton
- (b) Magnetic force
- (c) Magnetic force
- (d) Frictional force
- (e) Pressure

B. Short Answer Type Questions

1.	Contact forces	Non-contact forces
	A force which can be exerted by an object on another object only through 'physical touching' is called a contact force.	A force which can be exerted by an object on another object even from a distance (without touching each other) is called a non-contact force.
	Examples: muscular force and frictional force.	

2. Magnetic force can be used to gather iron pins scattered on the floor.
3. Electrostatic force might be responsible for attraction between the balloon and the wall.

4. The formation of fountains of water from the leaking pipes of the water supply pipeline tells us that water exerts pressure on the walls of its container (here the walls of water-carrying pipes).
5. Blood present in our body balances the atmospheric pressure acting on us.
6. Atmospheric pressure is involved in the filling of a liquid in a syringe.
7. The high air pressure produced by the gas molecules on the walls of the balloon causes it to expand and get inflated.
8. The pressure of a liquid increases with depth. Thus, the pressure of water will be less at a depth of 10 metres below the surface of the sea but it will be much greater at a depth of 20 metres below the surface of the sea.
9. The force is calculated as:
Force = Pressure × area
Force = $500 \text{ Pa} \times 0.5 \text{ m}^2 = 250 \text{ N}$
10. The state of motion of an object is described by its speed and the direction of motion. A force can change the state of motion of an object.

WORKSHEET– CLASS 8, CHAP. 9 FRICTION

A. Objective Type Questions

- | | |
|---|------------------------|
| 1. (c) Static, Sliding, Rolling | 2. (c) 5 N |
| 3. (b) 45 N | 4. (c) Drag |
| 5. (c) Sliding friction into rolling friction | 6. (c) Football ground |
| 7. (b) Static | 8. (d) Friction |

SAMPLE PAPER – CLASS 8, CHAP. 9 FRICTION

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|-----------------|-----------------|
| (a) motion | (b) streamlined |
| (c) streamlined | (d) heat |
| (e) less | |

2. Name the following:

- | | |
|--------------------|----------------------|
| (a) Friction | (b) Frictional force |
| (c) Oil | (d) Ball bearings |
| (e) smooth surface | |

B. Short Answer Type Questions

1. The spring balance is a device which is used for measuring force acting on an object.
2. The friction on wet marble floor (having a layer of water on it) becomes very small which cannot prevent us from slipping. So, many times people slip on wet marble floor and fall down.
3. It is difficult to walk on a well polished floor (or on ice) because the friction on these smooth surfaces is very small (which cannot prevent us from slipping).
4. Treads are made in the tyres of vehicles to increase friction and prevent skidding of vehicles on wet roads.
5. Gymnasts apply some coarse substance on their hands to increase friction for better grip.
6. Ball bearings are used between the hubs and axles of machines such as bicycles, and motor cars.
7. Oiling the axles of a bicycle reduces friction.
8. Grooves are made in the soles of shoes to increase friction and prevent slipping.
9. Treads are made in the tyres of vehicles to increase friction and prevent skidding of vehicles on wet roads.
10. We sprinkle fine powder on carom board to reduce friction.

WORKSHEET– CLASS 8, CHAP. 10 SOUND

A. Objective Type Questions

- | | |
|---------------------------------|----------------------------|
| 1. (d) Solids, liquid and gases | 2. (b) Amplitude |
| 3. (c) Rhinoceros | 4. (b) Very high frequency |
| 5. (c) 50 k Hz | 6. (a) In solid |
| 7. (b) Pitch | 8. (a) Radio waves |

SAMPLE PAPER – CLASS 8, CHAP. 10 SOUND

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|-----------------|---------------|
| (a) Noise | (b) Hertz |
| (c) time period | (d) frequency |
| (e) larynx | |

2. Name the following:

- | | |
|--------------------|---------------|
| (a) Vocal cords | (b) Water |
| (c) Auditory nerve | (d) Frequency |
| (e) ear canal | |

B. Short Answer Type Questions

1. The vocal cords of a man are about 20 mm long.
2. Sound travels at a speed of 5000 metres per second through iron (or steel). This is more than 3 times the speed of sound in water.
3. Sound travels fastest in steel (5000 m/s).
4. (a) Sound travels slowest in gases.
(b) Sound travels fastest in solids.
5. Ear drum vibrates when outside sound falls on it.
6. Three tiny bones are the malleus, incus and stapes. They transfer sound vibrations from your eardrum to your inner ear.
7. Auditory nerve carries electrical impulses from the cochlea of ear to the brain.
8. Time-period is equal to the reciprocal (or inverse) of frequency.
9. Sounds are produced by vibrating objects. If more energy is supplied to an object by plucking it or hitting it more strongly, then the object will vibrate with a greater amplitude and produce a louder sound.
10. The loudness of sound is expressed in the unit called decibel. The symbol of decibel is dB.

WORKSHEET – CLASS 8, CHAP. 11 CHEMICAL EFFECTS OF ELECTRIC CURRENT

A. Objective Type Questions

1. (d) Electrical energy
2. (a) Carbonic acid
3. (b) Carbon
4. (d) Electrolytic cell
5. (a) Silver nitrate solution
6. (a) Electroplating a metal on the same type of metal
7. (b) Distilled water
8. (c) Both of these

SAMPLE PAPER – CLASS 8, CHAP. 11 CHEMICAL EFFECTS OF ELECTRIC CURRENT

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|----------------------|-------------------------|
| (a) electroplating | (b) chemical |
| (c) weak | (d) acids; bases; salts |
| (e) hydrogen; oxygen | |

2. Name the following:

- | | |
|------------------|--------------------|
| (a) LED | (b) Chromium |
| (c) Electrolytes | (d) Electroplating |
| (e) Copper | |

B. Short Answer Type Questions

1. The full form of LED is Light Emitting Diode.
2. Vinegar conduct electricity but it is a weak conductor.
3. If a weak electric current flows through the liquid in the circuit, the magnetic needle of compass will show deflection.
4. (a) Oxygen gas is formed at the positive electrode.
(b) Hydrogen gas is formed at the negative electrode.
5. Bubbles of gases are formed when an electric current is passed through acidified water.
6. Chromium is usually electroplated on car parts such as bumpers and bicycle handlebars made of steel.
7. Tin is electroplated on iron for making cans used for storing food.
8. Silver and gold usually electroplated on cheaper metals for making jewellery items.
9. LED is a semiconductor device which glows even when a very weak current passes through it.
10. It is dangerous to operate an electric switch or touch a working electrical appliance with wet hands because the tap water present on wet hands is a conductor of electricity due to which it may conduct electric current from the electric switch (or electrical appliance) to our hand and give us an electric shock.

WORKSHEET– CLASS 8, CHAP. 12 SOME NATURAL PHENOMENA

A. Objective Type Questions

- | | |
|--------------------------------------|--------------------------|
| 1. (b) A copper rod | 2. (c) Benjamin Franklin |
| 3. (a) Deep under the crust of earth | 4. (d) Seismic waves |
| 5. (a) Electric energy | 6. (d) Rajasthan |

SAMPLE PAPER – CLASS 8, CHAP. 12 SOME NATURAL PHENOMENA

A. Objective Type Questions

1. Fill in the blanks:

- | | | |
|--------------|-----------------|--------------|
| (a) repel | (b) plate | (c) electric |
| (d) positive | (e) get charged | |

2. Name the following:

- | | |
|------------------------------|-------------------|
| (a) Negative electric charge | (b) Electroscope |
| (c) Benjamin Franklin | (d) Richter scale |
| (e) Negative electric charge | |

B. Short Answer Type Questions

1. The nature of the charge on the other object is positive.
2. The nature of the charge on the other object is positive.
3. Electroscope detect electric charges on a body.
4. When we touch the top end of the metal clip with the positively charged glass rod, then some of its positive charge is transferred to the top end of the metal clip. Now, since the metal clip is a good conductor of electricity, it conducts the positive electric charge to the two aluminium leaves held on its other end.
5. When lightning strikes a tree, it can burn up the tree and damage it with its enormous electric energy. And when a person is hit by lightning during a thunderstorm, then the electric energy passes through the body of the person due to which the person gets severe burns and gets killed.
6. Lightning conductor is a device used to protect a building from the effects of lightning.
7. Seismograph is an instrument which measures and records the magnitude of an earthquake in terms of the shock waves it produces.
8. The magnitude (or intensity) of an earthquake is expressed on the Richter Scale.
9. To charge an inflated rubber balloon by friction, rub it against a woollen cloth. The rubbing creates friction between the two surfaces, which causes electrons to transfer from the cloth to the balloon. This gives the balloon a negative charge and the cloth a positive charge.
10. After rubbing the plastic comb, the two aluminium leaves get negatively charged and hence repel each other. This repulsion causes the aluminium leaves to diverge.

WORKSHEET– CLASS 8, CHAP. 13 LIGHT

A. Objective Type Questions

1. (d) 120°
2. (c) Periscope
3. (d) Three
4. (a) Increases gradually
5. (c) The lens becomes thicker or thinner
6. (b) Auditory nerve
7. (d) 35°
8. (b) Retina
9. (b) Ciliary muscles
10. (d) Iris

SAMPLE PAPER – CLASS 8, CHAP. 13 LIGHT

A. Objective Type Questions

1. Fill in the blanks:

- | | |
|----------------|------------------|
| (a) large | (b) fewer |
| (c) Reflection | (d) Kaleidoscope |
| (e) $1/16$ | |

2. Name the following:

- | | |
|-----------------|------------------|
| (a) Ray box | (b) Periscope |
| (c) Glass prism | (d) Kaleidoscope |
| (e) Pupil | |

B. Short Answer Type Questions

1. (a) The ray of light which falls on the mirror surface is called incident ray.
(b) The ray of light which is sent back by the mirror is called the reflected ray.
(c) The angle between incident ray and normal is called the angle of incidence.
(d) The angle between reflected ray and normal is called the angle of reflection.
2. When a ray of light is incident normally (perpendicularly) on a plane mirror, the reflected ray will also travel back from the mirror along the normal.
3. (a) If the surface is smooth, then all incident rays coming from the same direction will also reflect in the same direction. This is called regular reflection.
(b) If the surface is rough, then the rays will reflect in many different directions, in what is called diffuse reflection.
4. Glass prism is used to split white light into seven colours.

5. If the amount of light around us is very high (as during the day light), then iris contracts the pupil (makes the pupil small).
6. The moon is a non-luminous object which does not have its own light. We can see the moon because moon reflects light (received from the sun) into our eyes. Thus, moon is a reflector of sunlight.
7. A periscope is a long, tubular device through which a person can see objects that are out of the direct line of sight. The periscope makes use of two plane mirrors to see over the top of things.

Uses of Periscopes are:

- A periscope is used to see over the heads of a crowd (say, as in a football match).
 - A periscope is used by soldiers sitting in a trench (or bunker) to observe the enemy activities outside (over the ground).
8. When two plane mirrors are kept inclined at an angle, they can form multiple images of an object. This is because the image of object formed in one plane mirror acts as object for the other plane mirror.
 9. The splitting up of white light into seven colours on passing through a transparent medium like a glass prism is called dispersion of light. The formation of spectrum (band of seven colours) shows that white sunlight is made up of seven colours.
 10. In bright sunlight the pupil of our eye is small. So, when we enter the cinema hall, very little light enters our eye and we cannot see properly. After a short time, the pupil of our eye expands and becomes large. More light then enters our eye and we can see clearly.

Teacher's Manual for

New Lakhmir Singh's **SCIENCE**

For Class
8

Lakhmir Singh's Science is a series of books for Classes 1 to 8 which conforms to the NCERT syllabus. The main aim of writing this series is to help the learners understand difficult scientific concepts in a simple manner in easy language. It provides a variety of life skills and challenges bringing about the all-round development of the students.

Lakhmir Singh's Science Teacher's Resource Kit is especially created for the teachers using Lakhmir Singh's Science textbooks. The kit has been designed as a medium to support the classroom lessons. The additional material would help the teachers to effectively teach the course book.

Salient features of Lakhmir Singh's Science Teacher's Resource Kit

- Detailed lesson plans to help the teachers brief the entire chapter
- Expected learning outcomes for distinct introspection enabling the students to comprehend the chapter
- Vocabulary for learning the list of new terms
- Warm-up activities to initiate the interest among the students for the chapter
- Projects, discussions and activities for continuous and comprehensive learning of the concepts
- Answers to the course book exercises
- Worksheets after every chapter for assessments to realize the understanding levels of students

Digital support

The digital content supplements book content through visuals, experiments, animations, interactive exercises and additional information.

NCF
2023

21st Century
Skills

Local
Knowledge

Cross
Curricular

Skill-based
Learning

Life Skills
& Values

Art
Integration

Experiential
Learning



S CHAND SCHOOL BOOKS

(An imprint of S Chand Publishing)

A Division of S Chand And Company Limited

(An ISO 9001 Certified Company)

Website: www.schandpublishing.com

E-mail: helpdesk@schandpublishing.com

Customer care (toll free) No.: 1800-1031926

10SE001827

₹ 100.00