THIRD EDITION

NEW OXFORD PRIMARY SCIENCE

Teaching Guide

LEVEL 2

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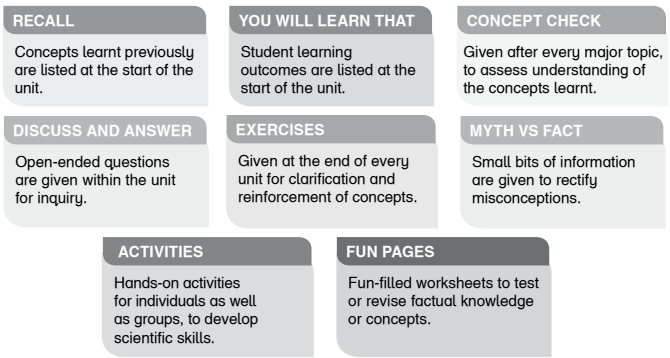
Introduction

This teaching guide consists of a scheme of work, worksheets, answers to questions in the book, sample assessment paper, and lesson plans. It is designed to support delivery of the National Curriculum effectively. It provides the teachers with teaching strategies to make learning student-centred, with simple and clear instructions for the teachers.

The following key features of the book have been integrated into the lesson plans, making it easier for the teacher to teach the lessons:



The PDF version of this teaching guide (available online at OUP website) allows teachers to adapt and modify lessons to suit the diverse needs of their students. As a result, teachers can focus their efforts on maximising the learning of their students.

A progression map is given to enable department heads and coordinators to plan for the progression of students' learning.

Scheme of work

The division of the syllabus (units) into two terms has been provided. A detailed scheme of work has also been provided according to which the teachers can plan their lessons over the terms. The scheme of work is flexible and adaptable to teachers' needs and school requirements.

Progression chart

This shows how NOPS builds on students' prior knowledge and progresses the topics from basic to more complex across the series.

National Curriculum Alignment

Each teaching guide also includes curriculum maps for that grade. It shows where each SLO of the National Curriculum is covered in the NOPS series.

How to Use this Teaching Guide

Background information

Brief background information has been provided before the lesson plans. It outlines the scientific knowledge necessary to teach a particular unit.

Lesson plan

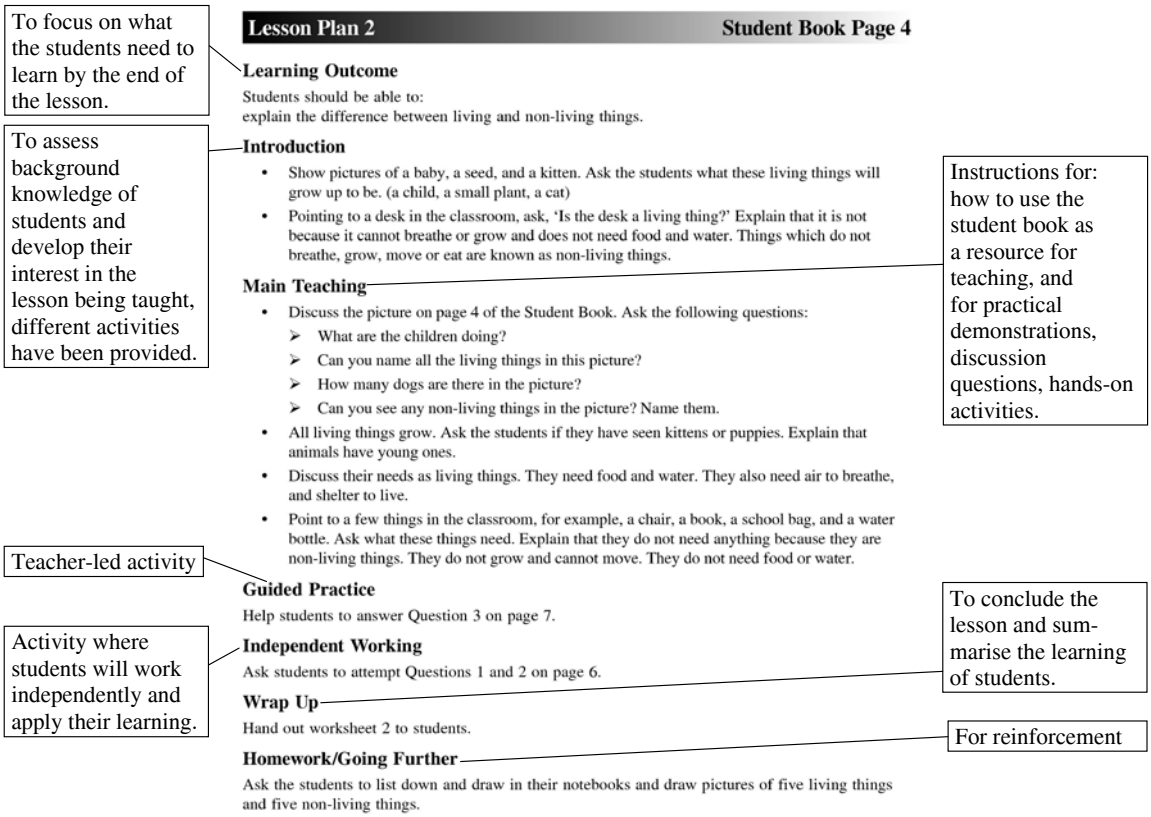
Teachers can use the provided lesson plans for each unit addressing the relevant learning outcomes as is or customise according to their class requirements. Lesson plans can be modified as per available resources.

i. **Learning outcome:** Each lesson plan is according to the lesson outcomes which are closely related to the student learning objectives from the National Curriculum.

ii. **Introduction:** Introduces the various techniques that are used in this teaching guide:

- Questions can be asked to check background knowledge or misconceptions about the concept being taught. This teaching guide gives interesting ways to encourage brainstorming and asking questions.
- For early years, pictures (flashcards) or videos can be shown to initiate introductory discussion.

- If resources are available, experiments or hands-on activities can be arranged. The teacher can ask questions before an experiment to elicit responses from students. After the results have been observed and recorded, ask what was done in the experiment and what happened. Do the results answer the questions posed at the start of the experiment? How do they explain what happened?



iii. **Main teaching:** After introducing the lesson, teachers can utilise the techniques suggested in the 'main teaching' section to lead the students through the lesson in detail. Use different techniques to make learning of the lesson as interesting for the students as possible. Demonstrations, hands-on activities, model-making, drawing diagrams, videos, field trips, reading, etc., can be used to teach the topic in detail.

iv. **Guided practice:** Activities requiring teacher guidance have been provided in this section.

v. **Independent working:** Suggestions on how to encourage students to work independently using the activities mentioned in the lesson plans.

vi. **Wrap up:** Conclude the lesson and summarise the learning of students by using wrap activities given in the lesson plans.

vii. **Worksheet:** Photocopiable worksheets have been provided with lesson plans, which can be used in the class or for homework.

Answers

Answers to all the questions given in exercises, fun pages, 'concept check', and 'discuss and answer' have been provided at the end of the lesson plans.

Assessment:

Sample Assessment Paper has been provided at the end of the teaching guide, based on the standard board format. The format of the sample paper can be used to design assessment papers.

Concept Check boxes given in the student book can be used for assessing learning during the class.

Topic Progression Across NOPS Series

Starter		Book 1		Book 2	
Unit	Ourselves	Unit	Ourselves	Unit	Ourselves
1	My Body	1	The Human Body - parts of the body and their functions - growth of living things	1	The Human Body - bones - muscles and joints - internal organs ((brain, heart, lungs, stomach) - sense organs
2	Healthy Habits	2	The Senses - senses and sense organs - movement	2	Health and Safety - looking after body - staying safe
		3	Healthy Habits - food for energy - health habits - illness		
	Living Things		Living Things		Living Things
3	Animals	4	Plants - plants and living things - parts of plants	3	Plants and Their Parts - types of plants - parts of plants - parts of a fruit - seeds
4	Plants	5	Animals and How They Live - basic characteristics of animals - animal food, importance of animals	4	Uses of Plants
5	Living and Non-Living Things			5	Animals - animals live in different places - special body parts - wild and domestic animals - animals and their young ones
	Materials and Matter		Materials and Matter		Materials and Matter
6	Materials	6	Materials and Object - shapes, size, texture and weight of objects - natural and man-made materials	6	Solids, Liquids, Gas - natural resources and man-made materials - solids, liquids, and gases - materials can change shape - more about rocks
				7	Measuring Instruments - measuring length - measuring weight - measuring time - measuring temperature - measuring liquids

Book 3		Book 4		Book 5	
Unit	Ourselves	Unit	Ourselves	Unit	Ourselves
1	The Human Body - brain - sense organs - skeletal system, muscular system,digestive system, circulatory system, respiratory system, nervous system, excretory system	1	The Human Body - cells - tissues - organs - skeletal system - muscular system	1	The Brain and Nerves - nervous system - sense organs
2	Health and Safety - exercise for body - balanced diet - sleep and rest - staying safe	2	Food and Balanced Diet - importance of food - food groups - food pyramid	2	Microorganisms, Health, and Disease - microrganisms - microorgansims and disease - keeping healthy
		3	Digestion - teeth and its type - taking care of teeth - digesting food - pancreas, liver, and gall bladder - eating habits		
	Living Things		Living Things		Living Things
3	Living on Earth - characteristics of living things - movement of animals and plants - growth - feeding - feeling - breathing - reproduction - habitats - ecosystems - extinct animals	4	Characteristics of Living Things - animal vs plant cells - characteristics of living things - dependency on eachother - life cycles	3	Life Functions - movement - growth - food - respiration - sensitivity - reproduction
4	The Life Cycles of Animals - life cycle of fish,insect, birds	5	Environments and Food Chains - environment components - classification of animals and plants - herbivores, carnivores,omnivores - food chains	4	Classification of Living Things - animals: vertebrates and invertebrates - friends or enemy
5	The Life Cycles of Plants - flowers, fruits, and seeds - germination - vegetables - life cycle of plant			5	Plants - non-flowering plants - flowering plants - comparing a monocot and a dicot - germination
	Materials and Matter		Materials and Matter		Materials and Matter
6	Materials - types of materials - properties of materials - kinds of materials	6	Solids, Liquids, and Gas - matter and its forms - changes of state	6	Soil - what is soil made up of? - layers of the soil - types of soil
		7	The Study of Matter - introduction to chemistry - mixtures, solutions - methods of seperation	7	Matter And the Water Cycle - solid, liquid, gas - comparing states of matter - changes of states - water cycle - reversible and irreversible changes

Starter		Book 1		Book 2	
	Forces, Energy, and Machines		Forces,energy, and Machines		Forces,energy, and Machines
7	Movement	7	Movement - introduction of movement - force is needed to move - use of machines to move	8	Electricity - mains electricity and batteries - batteries and cells
8	Sounds	8	Sounds - introduction to sound - loud and soft sound - different ways of producing sound	9	Light and Shadow - light is energy - sources of light - brigh and dim light - properties of light - what makes a shadow big or small - materials and light
9	Light and Colours	9	Light and Shadow - use of light - sources of light - bright and dim light		
	The Earth and the Atmosphere		The Earth and the Atmosphere		The Earth and the Atmosphere
10	The Earth and The Atmosphere	10	The Weather - types of weather - seasons	10	Water - importance of water - sources of water - uses of water - saving water
11	Air			11	The Environment - what environment is - protecting animals - three R's - looking after natural resources - deforestation
12	Water And Its Uses				
13	The Weather				
	Sky and Space		Sky and Space		Sky and Space
14	The Sky	11	The Earth, Sun,Moon, and Stars - shapes of earth - Sun - Earth travel round the Sun - Moon travel round the Earth	12	The Earth, Sun, Moon, and Stars - introduction to Earth and Sun - day and night - Moon its shape, life on Moon, and its rotation

Book 3		Book 4		Book 5	
	Forces,energy, and Machines		Forces,energy, and Machines		Forces,energy, and Machines
7	Force - introduction to force - kinds of force - friction - gravity	8	Heat - atoms - temperature - heat - thermometer	8	Forces In Action - measuring force - inertia - friction - ways to reduce friction - gravity - balanced and unbalanced forces - mass and weight - simple machines
8	Electricity - electric current - conductors and insulators - circuits - flow of current - complete circuit	9	Forces and Machines - speed - machines and types of machines	9	Electricity - atoms - electric charge - two types of electricity - electricity in nature - circuits and fuses
9	Simple Machines - work - tools or machines - transport	10	Circuit and Switches - complete and incomplete circuits - switches - series and parallel circuits - conductors and insulators	10	Magnets And Electromagnets - magnetic field - demagnetism - creating an electromagnet - electromagnets in use
10	Sound and Light - how is sound produced - how are sounds useful - loud or soft sound - sources of light - speed of light	11	Magnetism - what is a magnet? - magnetic materials - magnetic field - poles - making magnets	11	Light - pinhole camera - reflected light - shadows - eclipses
		12	Sound - sound waves - frequency - sound medium - noise, echoes		
	The Earth and the Atmosphere		The Earth and the Atmosphere		The Earth and the Atmosphere
11	The Earth - structure of Earth - how Earth was formed - rocks, minerals, soil	13	Movement of Earth - rotation - revolution - equator - seasons	12	Air - air has mass - the atmosphere - uses of air
				13	Environmental Pollution - biodegradable waste - non-biodegradable waste - causes of pollution - types of pollution - the three R's - environment watch
	Sky and Space				Sky and Space
12	The Earth - introduction to Solar system -objects in space - difference and similarities between a planet and a moon - satellites and space			14	Solar System - the solar system - space probes

Curriculum Map for Grade II

Themes	SLOs w (incl. Knowledge, Skills,Attitudes and STSE)	covered in unit:
Land	Recognise that the natural environment comprises living and nonliving things.	unit 11
	Name some natural resources.	unit 11
	Recognise the importance of natural resources.	unit 11
	Recognise the importance of the resources of land.	unit 11
	List the ways in which people use the land.	
Water	Recognise the importance of water for living things.	unit 10
	Identify the natural sources of water.	unit 10
	Identify the main sources of water in their locality.	unit 10
	Recognise the importance of the resources of water.	unit 10
	Narrate how water gets from a natural source to the taps in their home.	unit 10
	List the daily activities in which they use water.	unit 10
	Recognise that clean water should be used for drinking purposes.	unit 10
	Recognise that there are some people who always face shortage of water.	unit 10
Plants	Name the plants that grow in their surroundings.	unit 3
	Identify major parts of a plant.	unit 3
	List the functions of the root, stem, leaf and flower.	unit 3
	Identify the different kinds of leaves found around them.	
	Identify the roots that are eaten by people.	unit 4
	Name the plants around them which have flowers and which do not have flowers.	unit 4
	Identify that all fruits have seeds in them.	unit 3
Animals	List the animals they see in their surroundings (land, air and water).	unit 5
	Recognise that animals that live on land are different in features from those that live in air and water.	unit 5
	Recognise that all animals have young that grow into adults.	unit 5
	Name different animals and their young ones (horse and foal, swan and cygnets, frogs and tadpoles, butterflies and caterpillars).	unit 5
	Identify that some young animals do not look like their parents (frogs and butterflies).	unit 5
	List the animals that feed their young and look after them until they are grown.	unit 5
Conservation of the Earth's Resources	Suggest ways to save water.	unit 10
	Recognise the importance of forests for human beings.	unit 11
	Identify the ways in which the land is destroyed due to human activity (deforestation).	unit 11
	Suggest ways to reduce deforestation.	unit 11
Heat and Light	Identify sources of heat and light in their homes, schools and surroundings.	unit 9
	Group sources of light and heat into natural and human made.	unit 9
	Identify and describe methods of producing heat (burning and rubbing).	unit 9
	List the uses of heat and light.	unit 9
	Recognise that the intensity of heat and light is felt more as they come nearer to the source.	unit 9

Scheme of Work

Unit	Lesson plan number	Topic wise allocation of periods	Learning outcome
1st term			
The Human Body	Lesson no 1	2 periods	Your body has different parts
	Lesson no 2	2 periods	All body parts perform different jobs
	Lesson no 3	1 periods	The five sense organs.
Health and Safety	Lesson no1	2 periods	Your body is like a machine. Look after it.
	Lesson no 2	1 period	Safety rules at home and outside.
Plants and their parts	Lesson no 1	2 periods	Different types of plants.
	Lesson no 2	3 periods	Plants have different parts. Each part has a different function.
	Lesson no 3	2 periods	Uses of flowers, flowers grow into fruits.
	Lesson no 4	2 periods	Fruits have a skin and seeds. Seeds grow into new plants.
Uses of Plants	Lesson no 1	1 period	Plants are useful.
	Lesson no 2	1 period	Many things are made from plants.
	Lesson no 3	2 periods	We eat the different parts of a plant as food.
Animals	Lesson no 1	2 periods	Animals live on land, water and they can fly. They have different body parts.
	Lesson no 2	2 periods	There are wild and tame animals. Tame animals help us in many ways.
	Lesson no 3	2 periods	We get food and other useful things from animals
	Lesson no 4	2 periods	Some young of animals look like their parents, others do not.
Solids, Liquids, and Gases	Lesson no 1	2 periods	Some non-living things are made of natural material. Natural material comes from plants, animals, and minerals.
	Lesson no 2	2 periods	Matter has three states—solids, liquid,
	Lesson no 3	1 period	Materials can change shape.
	Lesson no 4	1 period	Rocks are found on the surface of the Earth and under the ground
Measuring Instruments	Lesson no 1	1 period	Scientists use measuring instruments.
	Lesson no 2	2 periods	It is important to use the right instrument to measure things accurately. Length, weight, time, and temperature.
2nd term			
Electricity	Lesson no 1	1 period	Electricity is a form of energy.
	Lesson no 2	2 periods	Mains electricity is made in a power station. Electricity can be dangerous.
	Lesson no 3	2 periods	Batteries and cell are used to store electricity. it is useful do not waste it.

Light and Shadow	Lesson no 1	1 period	Light travels in a straight line called rays.
	Lesson no 2	2 periods	Light can pass through some materials but not through others, shadows are formed when light is blocked by an object.
	Lesson no 3	1 period	Some surfaces reflect more light.
Water	Lesson no 1	1 period	All living things need water.
	Lesson no 2	2periods	Water from the land flows towards the sea. Water evaporates and forms clouds to make rain.
	Lesson no 3	2 periods	We store water and use it in many different ways.
	Lesson no 4	2 periods	It is important to save water. Suggest ways to save water.
Environment	Lesson no 1	2 periods	Our environment is all around us, we must keep it clean.
	Lesson no 2	2 periods	We must not waste natural resources, we must conserve them.
	Lesson no 3	2 periods	We can improve the environment by using the 3 'Rs'-- reduce, reuse and recycle.
	Lesson no 4	1 period	The effects of deforestation.
The Earth, Sun, Moon, and Stars.	Lesson no 1	2 periods	The Earth goes around the Sun. It takes one year to orbit the Sun.
	Lesson no 2	1 period	The Earth spins towards the East once every 24 hours. One side on the Earth has Day and the other side night.
	Lesson no 3	1 periods	The Moon is a sphere, it orbit the Earth. The light of the Moon we see is the reflected light of the Sun.

In this unit the students will learn more about some of the internal organs of the Human body. The students already have prior knowledge of some body parts and their functions. They will get introduced to the functions of the brain, heart, lungs, stomach, bones, muscles, and joints. They will study about their importance in the healthy functioning of the human body. The importance of senses will also be reinforced. The human body is like a machine, which has to be looked after by eating fresh food, drinking clean water, proper rest and exercise. Students can be asked to make safety rules to keep them from harm.

Unit 1: The Human Body

Lesson Plan 1 — Student Book Pages 2–3

Learning Outcome

Students should be able to:

explain that the body has many parts including bones, joints, and muscles.

Introduction

- Ask the students if they all have the same body parts: *eyes, nose, legs, etc.*
- Explore how these parts of the body help us, for example, we see with our eyes, we smell things with our nose, and we walk using our legs.
- State that we can see these parts of the body. Explain that you will now study the parts of the body we cannot see.

Main Teaching

- Read pages 2 and 3 of the Student Book with the students.
- Elicit that a person may be short, tall, fat, or thin, but the body will have similar body parts.
- Look at the picture of the skeleton on page 2.
- Explain that the bones give the body its shape.
- In an adult body there are 206 bones.
- Bones needs the help of the muscles and joints in order to be able to move.
- Joints are the place where two bones meet. Ask students to feel the joints at their knee, and elbows. They can also feel their shoulder and hip joints. Joints enable us to walk, sit, or run.
- The muscles pull on the bones to help to move the limbs. Muscles are in pairs; they contract and expand to generate movement when the brain tells them to do so. Muscles move our limbs, enable us to chew and digest our food, and make the heart work.

Guided Practice

Do the Concept Check on page 3.

Independent Practice

Ask the students to sit in pairs to count the number of joints in their hands.

Wrap Up

Recall that the skeleton is made of bones and that the bones, muscles, and joints are used for sitting, standing, and walking.

Homework/Going Further

- The students should attempt Question 2 on page 5.
- Ask the students to answer these questions.
  1. What is a skeleton?
  2. Why do we need muscles and joints?
  3. What would happen to the body if it did not have a skeleton?

Lesson Plan 2 — Student Book Pages 3–4

Learning Outcomes

Students should be able to:

- identify some of the organs of the human body.
- explain that different parts of the body perform different jobs.

Introduction

- Ask the students to put their right hand on the left side of the chest. Can they feel a soft beating movement? Can they also feel their chest move up and down?
- Explain that this is the beat of the heart and the lungs filling up with clean air and then pushing the used air out of the body.
- Explain that in this lesson they will learn about some of the organs of the body.
- Display a chart showing the heart, lungs, brain, and stomach.

Main Teaching

- Show the students the heart and lungs of a goat.
- Read pages 3 - 4 of the Student Book with the students.
- Explain that the heart pumps blood to all parts of the body. It is located a little to the left of the chest. The heart has special muscles which supply blood to all parts of the body. The heart is the size of your fist.
- The lungs take clean air into the body and push the used air out. The oxygenated blood is then pumped into the heart to be sent to all the different parts of the body.
- To demonstrate how the lungs work, pump air into the goat's lungs to show air filling the lungs. Press the lungs to push the air out.
- Explain that both the heart and lungs are protected by the rib cage.
- The brain controls the body and all our actions. It is protected by the skull. It is like a big

computer. It processes all the information that it receives from the senses and the body and sends messages back for action. Without the brain, our ability to walk, talk, think, or work, would be impossible.

- The stomach breaks up the food we eat into very small pieces. With digestive juices, the food is turned into the energy that the body needs. The body then absorbs the nutrients it needs to stay healthy.

Guided Practice

The students should answer Question 1 on page 5.

Independent Practice

The students should attempt Question 4 on page 5.

Wrap Up

Recap the functions of the heart, lungs, brain and stomach.

Homework/Going Further

Ask the students to write down in their notebooks, the work done by the following parts of the body:

a. heart
b. lungs
c. brain
d. stomach

Lesson Plan 3 — Student Book Page 4

Learning Outcome

Students should be able to:

identify the five sense organs with which we experience the world around us: eyes, ears, nose, tongue, and skin.

Introduction

- Bring to the lesson a baby's rattle, a small bottle of cologne, sweets, a small sheet of emery paper, and a soft, stuffed toy.
- Shake the baby's rattle and ask the students if they could hear the sound with their ears. Open the bottle of cologne and spray some in the classroom. Prompt the students if they can smell the perfume.
- Ask some students to feel the emery paper and the stuffed toy and decide which is rough and which is soft. Explain that they used their hands to feel the objects.
- Give the students some sweets and ask what they taste like. Their answers will vary depending on the sweet they tasted. Explain that they used the tongue to taste.

Main Teaching

- Read page 4 of the Student Book with the students.

- Identify the sense organs. Discuss the work of the sense organs and how they help us in our daily life. We have:
  - eyes to see,
  - ears to hear,
  - a nose to smell,
  - a tongue to taste, and
  - skin to feel.
- It is these five senses that enable us to experience the world.

Guided Practice

Ask the students to work in pairs to answer Question 5 on page 6.

Independent Practice

Ask the students to sit in pairs and make a list of 5 things they can usually hear, see, and smell in the school playground.

Wrap Up

Discuss how the five senses help us in our everyday lives.

Homework/Going Further

Ask the students to draw the sense organs in their notebooks and explain their functions.

Worksheet 1-1

Q1. On the picture of the skeleton, label the knee joint, elbow joint, shoulder joint, and hip joint.

Q2. Guess what I am:

1. I breathe in clean air and breathe out used air. What am I? _____
2. I am hard. I protect the brain. What am I? _____
3. I pump blood to all parts of the body. What am I? _____
4. I protect the lungs and the heart. What am I? _____
5. I help to digest your food. What am I? _____
6. I control your body and your actions. What am I? _____

Q3. Complete this table by using your five senses to experience some new sensations.

What I saw	What I heard	What I smelt	What I tasted	What I felt

Unit 2: Health and Safety

Lesson Plan 1 — Student Book Pages 8–10

Learning Outcomes

Students should be able to:

- explain that the body is like a machine and must be looked after properly.
- identify the needs of the body as clean water and air, fresh food, rest, and exercise.

Introduction

- Show the students pictures of different kinds of transport.
- Ask the students what transport they use to come to school, for example, by car, school bus, motor cycle, walking?
- Explain that the car, school bus, and motor cycle need petrol to work.

  Talk about the need to check the petrol, oil, water, and engine of the car regularly to help it run properly. Explain that the human body is like a machine. We have to take care of it by keeping it clean and eating healthy food.

Main Teaching

- With the students read Student Book pages 8 - 10.
- Discuss the picture on page 8 of the car at a garage.
- Explain that the men are cleaning the car inside and out and checking the air in the tyres, and the oil and water in the engine.
- Explain that the car is a machine and it has to be looked after to keep it running properly.
- Recall that the human body is also a machine which has to be looked after.
- Ask for suggestions on how we can keep our body healthy.
- Show pictures of fruits, vegetables, eggs, and meat, and explain that these are healthy foods.
- Explain that the body needs healthy food to make the bones and muscles strong.
- These foods also provide the necessary energy to do work.
- Explain that exercise is also important to keep all the body parts working properly. Explain that they should try to go out in the fresh air to do exercise or play.
- Explain that good habits also help us to keep our body fit and ask what good habits they have.
- Some examples are, going to bed early and getting up early, having a bath or shower daily, brushing your teeth and hair, wearing clean clothes, washing your hands after and before meals and after using the toilet, eating healthy food, and drinking at least 6 to 8 glasses of water daily.

Guided Practice

The students should sit in pairs and attempt the Discuss and Answer on page 10.

Independent Practice

- The students should do the Concept Check on page 10.

- The students should attempt Question 4 on page 15.

Wrap Up

- Ask the students how they keep their body strong. Why is it important to exercise and have good habits?
- Ask the students to name some healthy foods. Discuss how good habits help us.

Homework/Going Further

The students should answer these questions in their notebooks.

1. What do our muscles need in order to work?
2. Why is it important to wash our hands before eating?

Lesson Plan 2 — Student Book Pages 11–13

Learning Outcome

Students should be able to:

explain some of the rules that keep us safe at home and outdoors.

Introduction

- Show a picture of children playing in the road, playing with a box of matches, and playing near a pond.
- Ask if the children are playing safely and discuss the possible dangers.

Main Teaching

- Read pages 11 - 13 of the Student Book in class.
- Discuss the four pictures on pages 11 and 12.
- Discuss that teasing or annoying animals may make them bite, scratch, or kick you. Explain that some plants are poisonous, so it is dangerous to eat things they find growing on plants. Stress that they should only eat what their parents give them to eat.
- Ask the students if they think it is alright to taste everything you see growing on a plant? Explain why it is not, as some plants are poisonous. Only eat what your parents give you to eat.
- Ask the students who likes to go swimming? Explain that there are some rules for swimming, for example, they should not enter the water alone and never right after a meal.
- Explain that you must take care when you eat your food. It is important to wash your hands before you eat, chew your food properly, and eat slowly.
- Talk about the dangers associated with electrical appliances and machines.
- Explain that you should never play with any electrical appliance or machine. Never put your finger into the electric sockets. Never touch a hot iron or any hot pots or pans in the kitchen.
- Other safety rules include:
  - Do not put any sharp object into your ears.
  - Do not look directly at the Sun or any bright light.

- Cover your head if you are playing in the hot sun.
- Put your toys away after you have finished playing; you might get hurt if you fall on them.

Guided Practice

- Pair up the students to solve the Concept Check page 13.
- In pairs, the students should read the Discuss and Answer on page 13, and make their own rules for keeping safe.

Independent Practice

The students should answer Question 1 on page 14.

Wrap Up

Discuss Exercise 4 on page 13.

Homework/Going Further

The students should answer these questions in their notebooks.

1. How do loud sounds harm us?
2. In what ways is an electric kettle dangerous?

Worksheet 2-1

Q1. Fill these columns with the good habits you practice and healthy foods you eat

Good habits	Healthy foods

Q2. Write 5 classroom rules which will make your classroom a good place in which to learn.

This unit introduces the students to the difference between living and non living things. The teacher will help students recognise that plants are of many shapes and sizes, and that they all require water, soil, sunlight and air to grow. Plants not only provide us with food in the form of fruits, vegetables and grains but they also produce oxygen which is needed by all living things to survive. The trees are homes for birds and small animals, they provide shade, wood for making houses, furniture and even pencils. Many kinds of medicines are also made from plants. In this unit the students will not only learn about animals that live on land, but also about fishes in the water, and birds that fly. They will study how their body parts help animals to survive in the wild. They will review the importance of domesticated animals which provide us with meat, milk, eggs, wool, and hides.

Unit 3: Plants and Their Parts

Lesson Plan 1 — Student Book Pages 18–19

Learning Outcome

Students should be able to:

identify different types of plants.

Introduction

- Ask the students to recall that living things need food, water, and air, they grow, and they have babies.
- Ask them to name the major groups of living things.
- Explain that you are now going to study plants.

Main Teaching

- Take the students to a park or to a plant nursery to look at different kinds of plants.
- Ask the students to feel the leaves and stems of the plants if this is permitted.
- Read together Student Book pages 18 - 19.
- The students should be able to relate the plants they saw in the park or nursery to the pictures in the book. Elicit that plants grow where they find soil, water, air, and sunlight.
- Some plants grow in water.
- Plants are of different kinds and different sizes. Some are very small and others are very big.
  - ➢ Shrubs are small plants with woody stems, for example, a rose.
  - ➢ Herbs are also small plants, but with soft stems, for example, coriander, which is used to flavour food.
  - ➢ Creepers are plants with weak stems. They grow close to the ground, for example, a watermelon.
  - ➢ Climbers are plants which climb up other plants or tall surfaces, for example a grape vine.
  - ➢ Trees are tall, with a strong stem called a trunk, for example, a peepal tree. We can tell the age of a tree by counting the number of rings inside the trunk.

Guided Practice

Help the students to answer Question 2 on page 22 and Question 3 on page 23.

Independent Practice

Ask the students to work in pairs or groups to share the information they gained of the different kinds of plants by visiting the park or nursery. Give each group or pair an A4-sized sheet of paper on which they can draw pictures of a shrub, herb, creeper, climber, and a tree.

Wrap Up

Discuss which kind of plant they liked and why.

Homework/Going Further

The students should answer these questions in their notebooks.

1. Which part of the tree tells us its age?
2. What do plants need in order to grow?

Lesson Plan 2 — Student Book Page 19

Learning Outcomes

Students should be able to:

- identify different parts of a plant.
- explain the functions of the root, stem, leaf, and flower.

Introduction

- Explain that we all have the same body parts and name some of them, for example, head, shoulder, arm, leg, foot, hand, eye, ear, nose.
- Explain that most plants also have parts which perform similar functions.
- Ask the students to name the parts of a plant: root, stem, leaf, and flower.

Main Teaching

- Bring to the lesson a healthy a plant.
- Ask the students to name the parts of the plant.
- Read page 19 of the Student Book with the students.
- Explain that the plant's roots grow under the ground. They absorb water and nutrients from the soil for the plant. They also hold the plant in place.
- Explain that the stem grows upright, and supplies food and water to the plant. Food and water move through the stem to all parts of the plant. The stem also supports the plant.
- Explain that the leaves make food for the plant from sunlight. They also produce oxygen (a gas).
- Explain that the flowers are the part of the plant that make fruits and seeds. Seeds make new plants.

Guided Practice

- In pairs, the students should take a few bean seeds and put them on some wet cotton wool placed on a plate. Put the plate in a bright, airy place.
- Sprinkle a little water over the cotton wool every day.
- After a few days the beans will sprout. A small root and two leaves will appear.
- After a few more days a stem will also appear.
- The students should draw their observations and display the plants in the classroom.

Independent Practice

The students should draw a picture of a plant in their notebooks and label all its parts.

Wrap Up

Ask the students to explain the functions of the different parts of a plant.

Homework/Going Further

The students should write two sentences each about the root and the stem of a plant.

Lesson Plan 3 — Student Book Page 20

Learning Outcomes

Students should be able to:

- list some of the uses of flowers.
- explain that some flowers produce fruits.

Introduction

- Ask the students to bring one fresh flower or a picture of a flower to school. Display them.
- Encourage the students to comment on the different sizes and colours of the flowers.
- Ask the students to smell the flowers. Do they all have the same scent?
- Talk about the different places where flowers grow.
- Explain that a flower is a part of a plant.

Main Teaching

- The students have already observed some fresh flowers in the introduction.
- Ask the students to read page 20 of the Student Book.
- Refer back to the introductory activity and talk about the different colours of the flowers. Talk about the petals of the flowers; count them and discuss their size and how they feel.

  Talk about the ways in which flowers can be used, for decoration, in medicines, to make perfume, and even to flavour food. For example, roses and jasmine are used to make perfumes, and roses are used to flavour food.
- Explain that flowers produce fruits. Ask the students to name some fruit trees, for example, apple, mango, guava, pear.

- Discuss the picture of the food basket on page 20.
- Ask the students to name the fruits in the basket.
- Explain that some fruits have a thick skin, like bananas and watermelons.
- Some fruits have a thin skin, like apples and pears.
- It is important to remember that not all fruits that we see growing on a tree or shrub can be eaten. Some of these fruits can be poisonous. Also, not all fruits are sweet.

Guided Practice

Ask the students to sit in groups and brainstorm for the Discuss and Answer activity on page 20.

Independent Practice

Draw your four favourite fruits and colour them. Write why you like these particular fruits.

Wrap Up

Ask the students to name the flowers that they have seen. They can then say how many petals the flower has and if it has a sweet smell.

Homework/Going Further

The students should try to taste some of the named fruits and then list them under the headings, Sweet and Sour.

apple, banana, mango, apricot, plum, lemon, watermelon, guava, pineapple, peach

Lesson Plan 4 — Student Book Pages 20–21

Learning Outcomes

Students should be able to:

- explain that fruits have a skin, a fleshy inner part, and seeds.
- explain that seeds grow into plants.

Introduction

- The students should be asked to bring one fruit with them to the lesson.
- Ask them to take turns to describe their fruit.
- Ask them if they think that all fruits look the same? Do they all have the same taste?

Main Teaching

- Begin by reading pages 20 - 21 of the Student Book.
- Divide the students into groups of four.
- Each group should examine their fruits, and ask questions such as:
  - *Does the fruit have a skin?*
  - *Do all the fruits have a similar skin?*
  - *Does the fruit have a fleshy inside?*
  - *Are there seeds inside the fruit?*

- Help the students to cut their fruits.
- The students should try to count the number of seeds in their fruits. Some fruits, like apples, will have a few seeds; a mango has only one seed; a watermelon had many seeds.
- Explain that new plants grow from seeds.
- Seeds come in many shapes and sizes: they can be small, big, thick, round, or flat.
- Show them papaya seeds, watermelon seeds, apple seeds, and mango seeds. Peas and beans are the seeds of the pea and bean plants.
- Explain that nuts are the hard-shelled fruits of some plants. They have a hard covering and a single seed which is also hard. Walnuts and almonds are examples of nuts.

Guided Practice

Ask the students to collect the data about all the fruits of their group and write it on an A4-sized sheet of paper. They should record the name of fruit, kind of skin, colour, taste, smell, and number of its seeds.

Independent Practice

The students should answer Question 1 on page 22 and Question 4 on page 23.

Wrap Up

Discuss the data collected by the groups. Make a consolidated results table on the board.

Homework/Going Further.

Students should answer the following questions in their notebooks.

1. Do all flowers become fruits?
2. Which has a thicker skin, a plum or a mango?

Worksheet 3-1

Q1. Draw small pictures of different types of plant and also write a short description of each.

Type of plant	Description

Worksheet 3-2

Q1. Draw the four main parts of a plant. Write two points about each.

Worksheet 3-3

Q1. Answer these questions.

1. Name two flowers which are used to make perfume.
2. Name a flower which is used to flavour food.
3. What is a coconut used for?
4. Are almonds and walnuts dried fruits?
5. Do all fruits have a thick skin?
6. Name one fruit which has a thick skin.
7. Name two fruits which have a thin skin.
8. Do all flowers grow into fruits?
9. Do apples grow on a tree or a bush?
10. Do watermelons grow on trees?

Q2. Write the names of fruits that have one seed, a few seeds, and many seeds in the correct columns

No	One seed	A few seeds	Many seeds
1			
2			
3			
4			
5			

Unit 4: Uses of Plants

Lesson Plan 1 — Student Book Pages 25–26

Learning Outcomes

Students should be able to:

- identify ways in which plants are useful.
- identify different parts of plants that are eaten, such as fruits, leaves, stems, roots, grains, and seeds.

Introduction

- Ask the students to name some of the flowers and leaves which we use for decorating, for example, rose, jasmine, tube rose, branches of fir trees, etc.
- Explain that some plants give us food.

Main Teaching

- Read pages 25 - 26 of the Student Book with the students.
- Display a tray of fruits and vegetables. Ask the students to name some of them.
- Explain that plants produce the oxygen we need to live. If there were no plants, we would not be able to survive. Plants are called the lungs of the Earth.
- Birds make their nests in trees. Some small animals, like squirrels and monkeys, also make their homes in trees.
- We eat different parts of many plants. Plants absorb many minerals from the ground which, when we eat them, help to keep us healthy. Healthy plants also contain many kinds of vitamins.
- Ask the students to name some:
  - roots that we eat: beetroot, radish, carrots
  - leaves that we eat: spinach, lettuce, cabbage
  - stems we eat: sugarcane, celery
  - fruits we eat: mango, apple, banana
  - seeds we eat: beans, peas
  - grains we eat: wheat, rice
- Plants also give us shade in summer.

Guided Practice

- The students should work it in pairs and attempt the Discuss and Answer on page 28.
- They should also attempt to answer Question 6 on page 31.

Independent Practice

The students should attempt Questions 2 and 3 on page 29.

Wrap Up

Encourage students to give more information about the way we use the different parts of plants.

Homework/Going Further

Ask the students to answer Question 7 on page 31.

Lesson Plan 2 — Student Book Pages 27–28

Learning Outcome

Students should be able to:

identify things that are made from plants.

Introduction

- Explain that as well as food, plants also provide us with shelter and oxygen which is needed by all living things.
- Ask the students if they can suggest other ways in which plants help us.

Main teaching

- Read pages 27 - 28 of the Student Book.
- Ask the students to look at the things around them in the classroom and name some things that are made from plants, for example, door, desk, chair, soft board, book shelf, duster, pencil, book, uniform.
- Show the students some more things made from plants: tissues, paper, cotton duster, jute shopping bag, medicines, lotions, tea leaves, cooking oil.
- Some plants give us fibres such as cotton. We use this to make thread and cloth. We use jute fibre to make bags, mats, and carpets.
- Explain that wood from trees is used to make furniture, boats, and used in building houses and bridges, etc.
- Some wooden toys, such as building blocks, are also made of wood.
- Explain that the rubber of car tyres comes from the rubber tree.
- Ask the students to name some other things made of rubber, for example, rubber bands, gloves, erasers.
- Talk about cooking oil that comes from palm trees, sunflowers, olives, coconuts, and ground nuts.
- Explain that the bark of some trees, and some herbs and flowers are used to make medicines.
- Certain soaps, shampoos, and lotions contain coconut oil, neem, and aloe vera.
- Tea leaves come from the tea bush, and coffee beans come from the coffee plant.
- Sugar comes from sugarcane and sugar beet.
- Explain that dead plants can be composted (left to rot) to make fertiliser for plants.
- Explain that we must grow more trees to help to protect the Earth from global warming and keep our environment clean.

Guided Practice

Help the students do the Concept Check on page 27 in pairs.

Independent Practice

Ask the students to answer Question 1 on page 29.

Wrap Up

Help the students to make compost in class. They should collect dead leaves and put them in a bucket with a lid. They can also add banana peel. Add a little water and stir the compost with a wooden stick every few days. After two weeks the compost should be ready to be put onto plants as fertiliser.

Homework/Going Further

The students should answer Question 4 on page 30.

Worksheet 4-1

Q1. Make lists of three fruits, seeds, leaves, roots, and stems that we eat.

No	Fruits	Seeds	Leaves	Roots	Stems
1					
2					
3					

Q2. Give names of the plants used to make these products.

Product	Name of the plant used to make it
cooking oil	
tyres	
medicines	
sugar	
fruit juice	
soap/shampoo	
tea	
coffee	

Unit 5: Animals

Lesson Plan 1 — Student Book Pages 32–33

Learning Outcomes

Students should be able to:

- identify some animals that live on land, in water, and some that can fly.
- identify some special body parts of animals and explain how they are used.

Introduction

- Show flash cards of different animals that live on land, birds that can fly, insects that live in grass, and fish that live in water.
- Ask the students where a lion lives and how it protects itself from danger.

Main Teaching

- Ask the students to read pages 32 - 34 of the Student Book.
- Draw the following table on the board.

Animals that live on land				Animals that live in water	
No	Animals	Birds	Insects	Fish	Animals

- Ask the students for suggestions to write in the columns.
- Explain that animals live in different places and in different ways.
- Animals that live in the jungle have to hunt for their own food, so they have special body parts. For example, lions and tigers have sharp teeth and claws. They can also run very fast to catch their prey. Similarly, there are birds of prey, like eagles, hawks, and vultures, which have sharp claws, hooked beaks, and very good eyesight to help them catch their prey.
- Look at the two pictures on page 32.
- Ask the students to name the sea creatures in the first picture (dolphin, octopus, and fish). Explain that they eat smaller fish, sea creatures, or seaweed.
- Look at the second picture that shows a bird and a bird's nest, and insects such as butterflies.

  Explain that birds have beaks so they can peck at the grain that they eat, and pull worms from the ground. Some birds, like vultures, have a hooked beak to tear the flesh of dead animals. Most birds have strong wings so that they can fly away to protect themselves.
- Other animals have special body parts which they can use to protect and feed themselves.

- For example, ducks have webbed feet so they can swim in water to find their food. A giraffe has a long neck so that it can reach the leaves at the top of the trees.

Guided Practice

- Ask the students to do the Discuss and Answer activity on page 33.
  - Animals that live in the polar region have thick fur and body fat to protect them from the cold.
  - Monkeys have long tails to swing from branches of trees.
  - The elephant's long trunk helps it to pull branches down for food.
  - The colourful peacock feathers protect it from predators.
  - Fish use their fins to move through the water; the scales on the fish's body protect it from injury.
  - The horns on the head of a deer and a rhinoceros are for protection and fighting.
  - The camel's hump contains fat which it uses when food is not available.
  - Frogs live both on land and water; they have webbed feet which help it to swim.
- The students should attempt Question 1 on page 37.

Independent Practice

The students should attempt Questions 5 and 6 on page 38.

Wrap Up

Show different flashcards of animals. The students should look at each picture and say which special body part will help that animal.

Homework/Going Further

The students should answer Questions 7 and 8 on page 39.

Lesson Plan 2 — Student Book Pages 34–35

Learning Outcomes

Students should be able to:

- identify some wild animals and some domesticated animals**.**
- explain some ways in which domesticated animals help us.
- explain that we get food and other useful products from animals.

Introduction

- Show flashcards of different animals, and ask the students to name the animals which live with us in our homes and those that do not
- Explain that the animals that do not live with humans are known as wild animals.
- Those animals that live with humans and help us are called tame, or domesticated animals.

Main Teaching

- Discuss how wild animals find their food.
- Read age 34 of the Student Book and discuss the pictures.
  - Large wild animals, like lions and tigers, hunt and eat smaller animals.
  - Explain that elephants, rhinoceroses, and giraffes eat grass and leaves.
- Ask the students to name some animals that live in water, for example, shark and octopus.
  - Explain that they survive by eating smaller fish.
  - Crocodiles are meat-eating animals that live both on land and in water.
- Explain that some wild animals are known as scavengers because they eat the flesh of dead animals. Vultures, hyenas, and wild dogs are examples of scavengers.
- Ask the students to name some domesticated animals which help us, for example, dogs, cats, birds, cows, horses, sheep, and goats. These animals can be kept as pets or on farms.
- Ask the students to look at the pictures on page 35. Discuss the different ways in which animals help us. For example,
  - Cows and goats give us both milk and meat.
  - We also eat the meat of sheep, fish, chicken, and turkey.
  - Hens, ducks, and geese lay eggs that we eat.
  - We get silk from the silk worm to make silk scarves and clothes.
  - Cow hide gives us leather for jackets, shoes, and bags.
  - The wool from the sheep is used to make woollen clothes for winter.

Guided Practice

Divide the students into groups of five, for a group guided activity. Ask each group to write the names of:

1. wild animals that eat smaller animals.
2. wild animals that eat grass and leaves.
3. domesticated animals that we keep as pets.
4. domesticated animals that help us.
5. birds that can be seen in the garden or a zoo.
6. fish that you have eaten or know of.

Independent Practice

- Ask the students to do the Concept Check on page 36.
- The students should answer Question 8 on page 39.

Wrap Up

Students can note the data from their guided practice on the board.

Homework/Going Further

Ask the students to answer Questions 1 and 2 on page 37.

Learning Outcome

Students should be able to

name some young animals that look like their parents and some that do not.

Introduction

- Display a poster showing the window of a pet shop.
- Ask the students to identify the pets available.

Main Teaching

- Ask if any students have a pet cat or dog? If their pet has had young, did the kitten or puppies look like the mother cat or dog?
- Explain that some animals have young ones which look like them.
- Explain that some baby animals do not resemble their parents when they hatch out of the egg. For example, the butterfly, moth, and frog do not look like the parent animal.
- List the names of some baby animals, for example,

cat	-	kitten
dog	-	puppy
cow	-	calf
goat	-	kid
frog	-	tadpole
horse	-	foal
fish	-	fry
swan	-	cygnet
lion	-	cub
sheep	-	lamb

Guided Practice

In pairs, students should write the names of young animals that look like their parents and young which hatch out of eggs and do not look like their parents.

Independent Practice

Draw a picture of any pet animal with its babies.

Wrap Up

Ask the students to recall which young animals resemble their parents and which do not.

Homework/Going Further

The students should make a list of 5 birds that can fly and lay eggs. They should find out about two birds that cannot fly.

Worksheet 5-1

Q1. What am I?

I have a long tail. I use it to swing from tree to tree. I live in the jungle. I eat fruit and berries. I love eating bananas. What am I?_____	I am very big. I live in the jungle. In the zoo I give children rides. I have a long trunk and two long tusks. My trunk helps me to pull down branches of trees. What am I? _____
I live in the desert. I carry heavy loads on my back. I can live without food and water for several days. I have a hump on by back which helps me to live. What am I? _____	I have sharp teeth and claws. I hunt smaller animals to eat. My fur has black and orange stripes. I can climb trees. I also love to swim. What am I? _____
I am a bird. I have beautiful tail feathers. When I dance my tail feathers spread out like a fan. Everyone loves to watch me dance. What am I? _____	I have thick brown fur. I am very heavy. I do not walk very fast. I usually eat berries and seeds. I sleep in my den during the winter. What am I? _____

Worksheet 5-2

Q1. How do these animals help us?

Animal	How they help us
cow	
goat	
sheep	
hen	
silk worm	
fish	
duck	

Q2. Give the names of baby animals that look like the parent and animals that lay eggs.

Name of animal	Young of animal	Name of bird/insect	Young of bird/insect

The students will discover the different kinds of man-made and natural materials. Allow them to feel the objects to differentiate them. Inform them that a natural material is one we get from either plant, animals, or from the rocks on the surface or under the ground in the form of minerals. However, man-made material are those which have been made by scientist using some natural materials like sand or crude oil. Matter can be found in the three states—solid, liquid, and gas. Show how changes can be made in the three states by heating or freezing some materials, or by just twisting, pulling, or stretching it. Materials are of different sizes, weight, and length. Scientists use different measuring instruments to accurately measure each material being used. Students will learn about the different kinds of weighing scales, thermometers, using a measuring tape, and reading the time on a clock.

Unit 6: Solids, Liquids, and Gases

Lesson Plan 1 — Student Book Pages 44–45

Learning Outcomes

Students should be able to:

- name some non-living things that are made of natural materials.
- explain that natural materials come from plants, animals, and minerals.
- identify ways in which natural materials are useful.
- name some man-made materials.

Introduction

- Ask the students to take out their pencil and eraser from their pencil case.
  - ➢ Explain that the pencil is made from wood.
  - ➢ Explain that the eraser is made from rubber.
  - ➢ Explain that wood and rubber come from trees. They are natural material.
  - ➢ Plants, animals, and minerals provide us with natural materials.
- Ask the students to put their water bottles and lunch boxes on their desks.
  - ➢ Explain that these things are made of plastic.
  - ➢ Plastic is a man-made material which is made from crude oil.
  - ➢ Explain that the things around us are either made of natural materials or man-made materials.

Main Teaching

- Take to the lesson a cardboard box containing a cotton duster, a plastic glass, a wooden ruler, a steel spoon, a wooden kitchen spoon, tissue paper, a newspaper, a jute shopping bag, a paper clip, a plastic mat, a clay bowl, and a leather handbag.
- Make two columns on the board headed Natural materials and Man-made materials.
- The students should decide what each object is made of and help you write the names of the objects in the correct columns.

- Read pages 44-45 of the Student Book with the students.
- Explain that we get cotton and jute fibre from plants.
- Minerals, precious stones, coal, clay, and different metals come from under the ground.
- Humans use crude oil to make plastic, sand to make glass, and wood to make paper.

Guided Practice

Help the students to answer Question 1 on page 49.

Independent Practice

The students should attempt Question 2 on page 49.

Wrap Up

Ask the students to give examples of objects in the classroom made of natural materials and man-made materials.

Homework/Going Further

The students should answer these questions in their notebooks.

1. Name three things made of glass.
2. Name three things made of plastic.
3. Name three things made from natural materials.

Lesson Plan 2 — Student Book Pages 46–47

Learning Outcome

Students should be able to:

identify the three states of matter: solid, liquid, and gas.

Introduction

- Ask the students to look around the classroom and say what they can see, for example, desks, chairs, a pencil box, a water bottle, a lunch box, other students, etc.
- Explain that any object in the classroom that takes up space and has weight is known as matter.

Main Teaching

- Put the following things on the table to show the students the difference between solids and liquids: a jug of water, a bottle or can of cold drink, a packet of juice, a pencil case, a lunch box, a thick book, and some balloons.
- The students should classify the items as solid or liquid. Note the answers on the board in two columns headed Solids and Liquids.
- Take the jug of water and pour some of it into a bowl, a glass, and a cup. Explain that the water has taken the shape of the bowl, glass, and cup. Ask a few students to repeat this with the bottle of cold drink and the packet of juice. Liquids take the shape of the container into which they are poured. Liquids also have weight and we can see and touch liquids, and liquids can be poured.
- Now take the few solids. Ask a student to try to fit the pencil box into the jug: it is not possible.

Explain that solid objects have a definite shape and weight. We can see, feel, and describe a solid as being soft, hard, heavy, or light.

- Give each student an empty balloon. Ask them to feel their balloon to see that there is nothing in it. Now ask them to fill the balloons with air. What happens to the balloons? They become inflated with the air that the students have blown into them. Ask them to release the air and feel the balloon moving as the air rushes out. Explain that air is present all around us. We cannot see air but we can feel it, for example, when we run, or when we put our hand out of the window of a moving car.
- The air around us consists of gases. Oxygen is the most important gas; without it, living things cannot survive. Burning will not take place if there is no oxygen.

Guided Practice

Ask the students to sit in pairs and explore how liquids take the shape of their container. Give each pair a paper cup and a paper dish. They should pour some water into each container and observe. Help them hold a class discussion and then write a few lines on the result of their experiment.

Independent Practice

Ask the students to do the Discuss and Answer on page 46.

Wrap Up

Ask the students to name two liquids, two gases, and two solids.

Homework/Going Further

The students should answer Question 6 on page 50.

Lesson Plan 3 — Student Book Pages 47–48

Learning Outcome

Students should be able to:

explain that materials can change shape, and give examples.

Introduction

- Ask the students to say what materials different classroom objects are made of. For example, a desk is made of wood and steel, a school bag is made of nylon fabric.
- Explain that materials can be used in many different ways.

Main Teaching

- Take a piece of cloth or paper. Fold it in half, and again in half, to make quarters. Explain that we can change the shape of paper by folding it. Explain that to change the shape of a piece of wood or a rock, we must use tools to cut them. Give each student a sheet of coloured paper and ask them to give it a new shape.
- Explain that the shape of some materials can be changed by twisting, stretching, or bending them. Ask the students to name some materials which can be stretched. Discuss how wires can be twisted and plastic pipes bent.

- Demonstrate that water can take three forms—solid, liquid, and gas.
  - ➢ Take three insulated jugs and fill one with water, one with ice, and the third with boiling water.
  - ➢ Open the insulated jug containing boiling water so that the students can see the steam coming out of the jug. Explain that water can be heated to make steam, which is a gas.
  - ➢ Cover the mouth of the jug with a cold plate for a few seconds then remove the plate, and show the students that the steam has changed into water. Put some of the ice onto a plate. Ask the students to observe what happens to the ice after some time. It begins to melt.
  - ➢ Explain that water can be frozen to form ice, which is a solid; when it melts, it becomes water which is a liquid.

Guided Practice

Ask the students to discuss in small groups how the three states of water are used by us. They should write a few lines about each.

Independent Practice

The students should do the Concept Check on page 48.

Wrap Up

Ask the students to name the three states of matter.

Homework/Going Further

The students should answer these questions in their notebooks.

1. What does ice turn into when it melts?
2. How can we change water into a solid?

Lesson Plan 4 — Student Book Page 48

Learning Outcome

Students should be able to:

- recognise that rocks are found on the Earth's surface and underground.
- appreciate that rocks are used to make many things.

Introduction

- Show the students three bowls made of different materials and ask what they are made of? For example, marble, glass, and plastic.
- Explain that glass is made from sand, and plastic is made from crude oil.
- Explain that marble is a natural material; it is a form of rock.
- Rocks are found on the surface of the Earth and also under the ground.

Main Teaching

- Take four plastic containers. Fill one with pieces of marble and granite, one with pebbles and sand, one with chalk, and one with coal.

- Explain that these rocks come from under the ground. The pebbles and sand are pieces broken off from much larger rocks.
- Marble and granite are the strongest rocks, and are used to make floors, decorate buildings, and make items for decorative purposes. Machines are used to cut these rocks.
- Chalk is a soft rock. It is used to make paints to colour buildings and in schools to write on the blackboard. Coal is a soft, black rock found under the ground. It is used as fuel in power plants that produce electricity.

Guided Practice

- Ask the students to sit in pairs and write the names of five things made from marble and granite.
- Find out the name of the precious stone found in coal mines.

Independent Practice

Ask the students to answer the following questions, in their notebooks.

1. What are the two strongest rocks?
2. Name a rock which is black.
3. What is coal used for?

Wrap Up

Do the Discuss and Answer on page 49 with the students.

Homework/Going Further

Make a collection of rocks for a classroom display.

Worksheet 6-1

Q1. Write the names of four objects made from each of the materials.

	1	2	3	4
plants				
animals				
minerals				
plastic				
glass				
paper				

Q2. Write down three properties and two examples each of solids, liquids, and gases.

Solids	Liquids	Gases

Worksheet 6-2

Q1. a. Draw three pictures to show that gas takes up space and has weight.

b. Draw three pictures to show that water can be found in the three states of matter.

c. Draw pictures of three different solids.

Q2. Give two uses of each of these rocks.

marble	
granite	
chalk	
coal	

Unit 7: Measuring Instruments

Lesson Plan 1 — Student Book Page 52

Learning Outcome

Students should be able to:

name some measuring instruments and say how they are used by scientists.

Introduction

- Ask the students to estimate the weight of various items, for example, a few books, an apple, water in a bottle.
- Establish that they can say that the books are heavy and the apple is lighter than the books, but they will need to use measuring instruments to find the accurate weights.

Main Teaching

- Bring to the lesson a weighing scale, a kitchen weighing scale, a measuring tape, a ruler, a measuring cup and measuring spoons, lemon juice, sugar, water, and a jug.
- Demonstrate how these measuring instruments can be used to weigh or measure objects to find their exact weight or length. Explain that this is how scientists weigh or measure materials before performing an experiment. Solids are weighed in kilogrammes. Liquids are measured in litres. Length is measured in centimetres and metres.
- Weigh some student volunteers and measure the heights of others and, with the students' consent, note the results on the board.
- Read page 52 of the Student Book with the students.
- Make a jug of lemonade for the students. Measure half a cup of sugar with the measuring cup and put it in the jug with the juice of three lemons and one litre of water. Stir the mixture until the sugar dissolves in the water. The lemonade is ready to drink.

Guided Practice

- Working in small groups the students should measure their heights with the measuring tape and take turns to weigh themselves on the weighing scale. The data should be recorded.
- Find out, who is the tallest? Who is the shortest? Who is the heaviest? Who is the lightest?

Independent Practice

- Ask each student to individually measure their hands and feet with their scales. They can also measure their desk and chair.
- Ask them to note their measurements in their notebooks.

Wrap Up

Discuss the data collected by the groups during the guided practice.

Homework/Going Further

Find out:

1. how many grammes are there in a kilogramme?

2. how many metres are there in a kilometre?
3. how many millilitres are there in a litre?

Lesson Plan 2 — Student Book Pages 52–53

Learning Outcome

Students should be able to:

identify the correct measuring instruments to be used to take accurate measurements.

Introduction

As a recap of the previous lesson ask the students questions such as:

- *Is your school bag heavy or light?*
- *Which is the heaviest book in your bag?*

Main Teaching

- Read pages 52 and 53 with the students. Ask if they have seen the different kinds of weighing scales and the clocks shown on page 53.
- Arrange five desks in the front of the classroom.
- Desk no 1 will have strips of paper of different length. The measuring instrument to be used will be a ruler. One group of students should measure the paper strips with the ruler. The measurements will be noted on the paper strips.
- Desk no 2 will have a few jugs of water and cups and glasses of different sizes. This group has to find out which glass or cup holds the least and the most water.
- Desk no 3 will have different kinds of weighing instruments. The students will weigh a book on each weighing instrument to check if they get the same reading. They can also weigh a pencil case or a lunch box.
- Desk no 4 will have a clock. In turn, pairs of students will check their writing speeds. One will look at the clock to check how long his partner takes to copy two sentences from a book. They then swap roles. Who was faster?
- Desk no 5 will have a measuring tape and the students will measure the height of the desk, the chairs, and the teachers table. They will make a note of their readings in their note books.
- Show the students a clinical thermometer. Explain that it is used to measure the body temperature, particularly when you are ill. Different types of thermometer are used to measure the temperature of the air, food, and water.

Guided Practice

- Help the students work in groups to complete the Concept Check on page 53.
- They should do the Discuss and Answer on page 54.

Independent Practice

The students should attempt Questions 2 and 3 on page 55.

Wrap Up

Ask the students which instruments they used to measure length and height. Talk about the different kinds of weighing scales. Discuss how time is measured by a clock.

Homework/Going Further

- The students should answer Question 1 on page 55.
- They should do the Concept Check on page 54.

Worksheet 7-1

Q1. Measure the length and width of these objects in your home.

Object	Measurement
television	
bed	
dining table	
sofa	
chair	
front door	

Q2. Make a height and weight chart of five of your friends.

No	Name of friend	Height	Weight
1			
2			
3			
4			
5			

This unit reinforces the student's knowledge of the different ways in which we use electricity. Introduce them to the difference between Mains electricity, batteries, and cells. Put emphasis on careful use of the Mains electricity, as it is very dangerous. Batteries and cells are used to store electricity. Machines which use batteries are safer to use. The students already are aware of the fact that the Sun is a natural source of light. Discuss with students the names of different sources which gives us light at night. Help them discover that light always travels in a straight line. Conduct activities using a flash light or a candle to show how shadows are formed. Use different objects to explain the meaning of transparent, translucent, or opaque.

Unit 8: Electricity

Lesson Plan 1 — Student Book Page 59

Learning Outcome

Students should be able to:

explain that electricity is a form of energy.

Introduction

- Ask the students what makes the fan and the lights in the classroom work.
- Ask them to name other machines that work with electricity, for example, television, iron, toaster, microwave oven.

Main Teaching

- Continue brainstorming with the students about how electricity helps us. For example:

  What did you use to iron your uniform? An electric iron.

  What kept your room cool? The air conditioner.

  How did you get the water in your taps? The water pump.

  What about cold water and ice cream? The refrigerator.

  How do you watch your favourite programme? The television.
- All the students' responses should be noted on the board.
- Explain that all these appliances use electricity, which is a form of energy that you cannot see, but it does work and helps you to live a comfortable life.
- Explain that the electric light bulb was invented by an American inventor named Thomas Edison in 1879. If necessary, explain that an inventor is the first person to make a new thing.

Guided Practice

Help the students come up with a list of things that work with electricity in school.

Independent Practice

Give each student an A4-sized sheet of paper, and ask them to draw one electric appliance which is very useful. Display their drawings in the classroom.

Wrap Up

Ask the students to list ways in which electricity helps us.

Homework/Going Further

The students should answer these questions in their notebooks.

1. What is an inventor?
2. Who invented the first light bulb?

Lesson Plan 2 — Student Book Pages 59–60

Learning Outcomes

The students should be able to:

- explain that mains electricity is produced in a power station.
- explain how electricity can be dangerous.

Introduction

- Recall the previous lesson in which the students were introduced to the use of electricity in helping us to live a comfortable life. Ask where electricity comes from.

Main Teaching

- Read pages 59 - 60 of the Student Book with the students.
- Explain that electricity is produced in a power station. Ask the students if they have seen a power station near their homes. Take them out and show them a power station if there is one near the school.
- Explain that the thick cables from the power station bring the electricity to the home, school, or the other places. Mains electricity is very powerful, as it helps to run all the appliances and machines.
- Explain the importance of handling electricity safely and discuss the safety rules.
  - Do not play with electric wires or appliances.
  - Never touch the electric switch or appliance with wet hands.
  - Do not put your finger or a metal object in a power point.
  - Do not touch the electric pole on the street when it is raining or if there is water around the pole.

Guided Practice

Ask the students to sit in pairs and brainstorm some more safety rules about using electricity. The rules should be written in their notebooks.

Independent Practice

Draw a picture of a power station.

Wrap Up

- Discuss where electricity is produced.
- Revise the safety rules for using mains electricity.

Homework/Going Further

- The students should answer these questions in their notebooks.
  1. Where does the electricity we use come from?
  2. Write two safety rules we must follow when we use mains electricity.

Lesson Plan 3 — Student Book Page 60

Learning Outcomes

The students should be able to:

- explain that batteries are used to store electricity.
- identify ways to avoid wasting electricity.

Introduction

- Ask each student to bring a battery-operated toy to school if they have one.
- Ask the students to name some items that use batteries, for example remote-control toys, a tablet, a torch, a mobile phone.
- List their answers on the board.

Main Teaching

- Read page 60 of the Student Book with the students.
- Explain that a small battery cannot run a big machine as it does not have enough power. There are large batteries which run cars, lorries, and heavy machinery.
- Explain that appliances which run on batteries are safer than those that use mains electricity, but it is important to use them correctly.
- A small battery must not be put in your mouth as it contains chemicals which are harmful. Used batteries should not be thrown away carelessly. There are often special places where used batteries can be disposed of safely.

Guided Practice

- The students can sit in small groups and share the battery-operated toys that they have brought to school.
- They should do the Discuss and Answer on page 61.

Independent Practice

- The students should do the Concept Check on page 61.

- The students should answer Question 1 on page 62.

Wrap Up

Ask the students to explain the difference between mains electricity and batteries.

Homework/Going Further

The students should answer these questions.

1. Why can we not use small batteries to operate large electrical appliances?
2. Write the name of one object that works with a battery and one that works by mains electricity?

Worksheet 8-1

Q1. Write the names of five objects which run on mains electricity and five that use a battery.

No	Objects that run on mains electricity	Objects that run on a battery
1		
2		
3		
4		
5		

Q2. Look around your house and see how many helpful appliances there are. Name any six which you think are very important and draw a picture of each.

Unit 9: Light and Shadow

Lesson Plan 1 — Student Book Pages 64–65

Learning Outcomes

Students should be able to:

- explain that light travels in straight lines called rays.
- Name some natural and some man-made sources of light.

Introduction

Explain that we are not able to see in a dark room and that in order to be able to see, we would need to turn on a light.

Main Teaching

- Explain that light is a form of energy.
- Ask a student volunteer to wear a blindfold. Write something on the board and ask her/him what you have written. She/he will not be able to answer. This shows that if light cannot enter the eyes, we cannot see. When the blind fold is removed, light can enter the eyes and she/he will be able to see again.
- Read Student Book pages 64-65 with the students.
- Explain that the Sun is the main source of light during the day. It gives us natural light. It is very powerful.
- Warn the students that they should never look directly at the Sun because this may damage their eyesight.
- Explain that the Moon gives us light when it is visible at night. The Moon reflects the light of the Sun but does not produce its own light. The stars are also sources of natural light and they give us some light at night.
- Explain that other sources of light are man-made.
- Show the students some of these sources of light, or pictures of them, and ask them to name them, for example, light bulb, fire, torch, and candle.
- Explain that the man-made sources of light do not all have the same brightness: for example, a light bulb gives a brighter light than a candle.
- Ask the students to compare the light of the bulbs in the classroom to that of the Sun and say which is brighter.
- Explain that light always travels in straight lines known as rays.
- Ask them to look at the light coming into the room through a small gap in the curtains, or between two pieces of card and notice that the light is coming straight into the room.

Guided Practice

Help the students discuss the Concept Check on page 65.

Independent Practice

The students should complete Concept Check 2 on page 67.

Wrap Up

Recap:

- The Sun is the biggest source of natural light.
- The Moon reflects the light of the Sun at night.
- When it is dark, we use man-made light.
- Light always travels in a straight line.

Homework/Going Further

The students should answer these questions.

1. Name the main source of light.
2. Write and draw some man-made sources of light.

Lesson Plan 2 — Student Book Pages 65–66

Learning Outcomes

Students should be able to:

- identify materials through which light can and cannot pass.
- explain how a shadow is formed.

Introduction

- Take the students outside and ask them sit in a circle in the shade. Talk about how the shade is formed because the rays of the Sun are blocked by a solid object such as a tree. While still outside, ask a few student volunteers to stand in the Sun.
- Notice how shadows are formed behind or in front of them.

Main Teaching

- Revise the fact that light travels in straight lines called rays.
- Read pages 65 - 66 of the Student Book with the students.
- Explain that light cannot pass through solid objects, so shadows are formed where the light is blocked.
- Switch off the lights in the classroom and shine a torch on a duster, so that a shadow is formed. Measure the shadow.
- Move the duster farther away from the torch and measure the shadow again. Bring the duster close to the torch and measure the shadow.
- Explain why the shadow is longer or shorter relative to the postion of light source.

Guided Practice

The students can sit in groups to experiment with forming shadows using their pencil cases and torches. They should draw pictures of their results.

Independent Practice

The students should complete Concept Check 1 on page 67.

Wrap up

Discuss the main points of the lesson: How does light travel? Can light pass through a solid object? How is a shadow formed?

Homework/Going Further

The students should answer these questions.

1. How are shadows made?
2. What are the straight lines of light called?

Lesson Plan 3 — Student Book Page 66

Learning Outcomes

Students should be able to:

- identify some surfaces that reflect more light than others.
- identify materials through which light can and cannot pass.

Introduction

- Give each student three strips of paper which can cover both their eyes. One strip will be made of writing paper, the second of greaseproof paper, and the third of clear cellophane paper.
- Ask the students to cover their eyes with each strip in turn and say what they can see through them.

Main teaching

- Make a small hole at one end of a shoe box. On the other end, make a slit big enough to put a cardboard square in it. Place a lighted torch inside the box. First insert a small cardboard square.
- Explain that the torchlight cannot be seen through the cardboard. Repeat twice using the greaseproof paper and with a small square of glass.
- Read page 66 of the Student Book with the students.
- Explain that light cannot pass through solid objects. We call these objects opaque. Ask the students to look around and name things in the classroom which are opaque.
- Remind the students that they could not see clearly through the greaseproof paper. Explain that there are some materials through which light does not pass completely. These objects are known as translucent. Ask them to name some objects which are translucent, for example, tracing paper, frosted glass.
- Explain that light can pass through objects made of clear glass and plastic. These objects are

known as transparent. Examples of transparent objects are water, a glass, clear plastic.

- Explain that shiny objects reflect light. Ask them to name some shiny objects such as a mirror and things made of silver, gold, or stainless steel.

Guided Practice

- The students should answer Question 1 on page 68.
- They should work together to answer Question 5 on page 69.

Independent Practice

The students should answer Question 6 on page 69.

Wrap Up

Discuss what they understand by the terms opaque, translucent, and transparent.

Homework/Going Further

The students should answer these questions.

1. Name some objects through which light cannot pass?
2. What do we call these objects?

Worksheet 9-1

Q1. Draw some sources of light.

Sources of natural light	Sources of man-made light

Worksheet 9-2

Q1. Draw a scene which consists of three trees, a house, a car, and some bushes. Each picture should show a light source and shadows on the ground.

Worksheet 9-3

Q1. In the spaces below, draw and write the names of four opaque, four transparent, and four translucent objects.

Opaque objects
Transparent objects
Translucent objects

This unit provides emphasis on conserving water by building and using dams, reservoirs, and canals to store water. Introduce the students to how the rainfall on land creates the various sources of fresh water—lakes, wells, springs. Explain to the students the various ways in which they can also help in the conservation of water in their everyday life. Remind students that we share our environment with other living things. It is therefore important to keep it healthy for everyone. Conduct an activity of discussing with the students how they can keep their classroom tidy. Explain to them the 3 R's—reuse, recycle, and reduce. Encourage the students to participate in an activity on the 3 R's. Explain how deforestation has affected the environment and the ways we can help to reduce the loss of trees.

Unit 10: Water

Lesson Plan 1 — Student Book Page 72

Learning Outcome

Students should be able to:

explain that all living things need water.

Introduction

- Ask what would happen if you did not get any food.
- Explain that you would be able to survive, for a few days, but if you do not get water for a few days, you would not be able to survive.
- Water is important for all living things.

Main Teaching

- Explain that from the time we get up to the time we go to bed we are using water for something or the other.
- Ask the students to name ways in which we use water, for example, for drinking, for washing ourselves, washing clothes, watering plants, and keeping our surroundings clean.
- Explain that plants get their water and food from the soil, so we need to water them if the soil is dry.
- To demonstrate that plants need water, place two small potted plants on the window sill. Water one plant daily, but do not water the other plant. After a few days, see which plant is still healthy and which one is not.
- Animals that live on land need water for drinking and to keep cool during hot weather. Animals that live in water cannot survive without water.
- Talk about other uses of water. It is used for cooking. It is used to make buildings and houses. It is also used in factories for manufacturing different things for our use.
- We even use water to run big machines which make electricity.
- Explain that it is important to drink clean water. Water can be cleaned by filtering or by boiling it. Water which does not come from a fresh water source can cause diseases. We should drink at least 8 glasses of water a day in summer and 6 glasses in winter.

Guided Practice

Give pairs of students a sheet of A4 paper on which to make a list of how water can be used.

Independent Practice

In your notebooks, write and draw two ways in which we use water.

Wrap Up

Recap the importance of water in our lives. List the students' ideas on the board.

Homework/Going Further

The students should answer these questions.

1. Why must we always drink clean, fresh water?
2. How many glasses of water do you drink in a day
   a. in the summer? b. in the winter?

Lesson Plan 2 — Student Book Pages 72–73

Learning Outcomes

Students should be able to:

- explain that water from the land flows towards the sea.
- explain that water evaporates, forms clouds, and falls as rain.

Introduction

- Talk about how water gets into our homes through pipes and flows when the tap is turned on.
- Explain that the water in the pipes originally comes from lakes, rivers, and streams. Ask where this water comes from.

Main Teaching

- Read pages 72-73 of the Student Book with the students.
- Put up a chart or draw the water cycle on the board.
- Describe that as the Sun shines on the water in the lakes, rivers, streams and ponds, water evaporates. This evaporated water turns into water droplets that join together to form clouds. The rain clouds cool and the water in them falls as rain and again puts water in the rivers, streams, lakes, and ponds. Some water is also absorbed into the ground. This process is called the water cycle.
- Many mountains are covered with snow during the winter. In the summer the snow begins to melt. It flows down the slopes of the mountains and brings more water into the rivers and streams.
- Water in the rivers flows into the sea. The sea water is salty because many impurities and minerals have dissolved in it on its long journey to the sea. We cannot drink sea water.

Guided Practice

Ask the students to work in pairs to draw a diagram of the water cycle.

Wrap Up

Recap the stages of the water cycle.

Homework/Going Further

Write 3 or 4 sentences to explain what happens to rainwater when it reaches the Earth.

Lesson Plan 3 — Student Book Page 73

Learning Outcome

The students should be able to:

list ways in which we store and use water.

Introduction

Remind the students of how the water cycle brings rain to the Earth. Ask them to name places where we store water.

Main Teaching

- Show pictures of dams built on rivers in Pakistan, wells, and the canal system which takes water to areas where there are no rivers or lakes.
- To demonstrate how rain water is absorbed in the ground, sprinkle water on some dry soil in a clear beaker and see how the water slowly goes to the bottom of the beaker. Similarly, when it rains, the rain water seeps down into the ground. This water is known as ground water.
- In some areas it comes out of the ground as natural springs. In some places water pumps are used to draw the water up to the surface for use.
- Explain that the flow of water in rivers can be blocked by building a wall across the river. These walls are very strong and are known as dams. The river water can be stored behind them in reservoirs for use when there is little water in the river.
- Tell the students about some of the large dams in Pakistan that store water and produce electricity: Tarbela Dam, Mangla Dam, and Warsak Dam. The Hub Dam supplies water to Karachi.
- Explain that canals are dug so that water from a river can be taken to places where there is little or no rainfall. The province of Punjab has a very large system of canals.
- Explain that reservoirs are built to store water near cities and towns to supply water through pipelines to the houses. The water from the reservoirs is cleaned by passing it through a water treatment plant to make it fit for home use.

Guided Practice

Help the students attempt the Discuss and Answer on page 74.

Independent Practice

The students should attempt to answer Questions 1 and 2 on page 75.

Wrap Up

Discuss how dams, ground water, canals, and reservoirs are used to store water for our use.

Homework/Going Further

Ask the students to complete the worksheet questions.

Lesson Plan 4 — Student Book Page 74

Learning Outcomes

Students should be able to:

- explain why it is important to save water.
- suggest some ways of saving water.

Introduction

Remind the students that it is very important not to waste the water that we use. Water is very important in the lives of all living things.

Main Teaching

- Read page 74 of the Student Book with the students.
- Explain that untreated water is water which contains chemicals from factories, and even our homes, where we use soap and detergent to clean and to wash our clothes.
- Discuss how the water in rivers is polluted when untreated water from factories and homes flows into the river water. When this happens, the polluted water kills the water animals and plants that live in the river.
- Explain how people in many places on our planet do not have enough water for their daily needs. We must try to save water.
- Ask the students to suggest ways to save water. Note their suggestions on the board. For example,
  - Turn off the tap while you are brushing your teeth.
  - Take a short shower.
  - Do not let your bucket or tub overflow.
  - Save the water used for washing vegetables and fruit to water the plants.
  - Put a bucket under the AC to collect the water.
  - Repair dripping taps.
  - Do not release untreated water into the rivers.
  - Water plants in the evening when it is cool so that the water does not evaporate.

Guided Practice

Guide the students to discuss and come up with a list of ways in which water can be saved.

Independent Practice

Using one of the suggestions draw an awareness poster for display in the classroom.

Wrap Up

Recap by reminding the students of the impending shortages of water if we do not take care of it.

Homework/Going Further

Ask the students to make a chart showing how we can save water to display in your classroom.

Worksheet 10-1

Q1. Draw and write about five ways in which we use water.

Worksheet 10-2

Q1. Draw a diagram of the water cycle and label it.

Q2. Fill in the blanks

1. Write the names of the largest dams in Pakistan.

   a. _____

   b. _____

   c. _____

2. Which dam supplies water to Karachi. _____
3. Water from under the ground is taken out with the help of _____.
4. River water flows into the _____ .
5. Why is sea water salty? _____
6. Why are reservoirs important for cities? _____

Unit 11: The Environment

Lesson Plan 1 — Student Book Page 77

Learning Outcomes

Students should be able to:

- define the environment.
- explain why we need to keep our environment clean.

Introduction

- Introduce the term environment as our surroundings.
- Show the students pictures of a school, a home, and a market. Give them a few minutes to think of what they might find in these three environments.
- Draw three columns on the board and list their suggestions.

Main Teaching

- Explain that an environment consists of living things as well as non-living things. Our school and our homes are a part of our environment. Our city also becomes a part of the environment. On this Earth we all live in an environment of which all of us have become a part.
- Show pictures of a desert, a forest, an ocean, and mountains. Compare these environments to that of your city. Discuss the differences between the environments. Explain that we cannot relocate a giraffe to a desert or a camel to a forest. All animals and plants are adapted to their own environment. Discuss what a camel and a giraffe eat? Will they adjust to a different environment? Look at their bodies, especially their feet.
- Ask the students whether the classroom environment is clean. If the answer is yes, it means that the students are already aware of keeping their environment clean. If the answer is no, it means that awareness has to be created among them. Let the students brainstorm ideas for keeping the environment clean and list them on the board. Ideas might include:
  - Do not throw paper and pencil shavings on the floor. See that all the desks and chairs are in their proper places.
  - Do not throw water in the classroom.
  - Take care of the charts on the soft boards.
  - Do not write on the desks or walls.
  - Do not stick charts on the walls or window panes.

Guided Practice

The students should do the Discuss and Answer on page 77 in pairs and make the required list in their notebooks.

Independent Practice

Write five ways in which you keep your room clean at home.

Wrap Up

- Ask the students to define an environment. Discuss whether forest animals can adapt to living in the mountains.
- Why can't a water-lily plant grow in the sea?

Homework/Going Further

Ask the students to complete the worksheet.

Lesson Plan 2 — Student Book Page 78

Learning Outcome

The students should be able to:

explain why we must conserve and not waste natural resources.

Introduction

- State that nature is the plants and the animals that we see around us.
- State that it is our duty to take care of plants and animals.
- Remind how plants provide us with oxygen which we need in order to live, and many animals help us in many different ways.

Main Teaching

- Show the students pictures of different natural environments.
- Explain that the Earth has many natural resources such as air, water, soil, crude oil, and natural gas. Besides these we have the plains, the forests and the jungles, the mountains and hills, the oceans and the rivers. Each of these places has its own environment, which includes the animals and plants that live there. When we begin to misuse an environment, we begin to lose the soil, plants, and animals. Many animals and plants have become extinct because their environment was misused.
- Ask the students to name some animals that are extinct, such as dinosaurs, the dodo bird, and Tasmanian tiger. Read page 78 of the Student Book with the students.
- Look at the pictures on page 78 of three animals which will become extinct if we do not take care of their environments and keep them safe. Ask the students to suggest ways in which these animals can be protected. Ideas might include:
  - We must make animal sanctuaries to protect the animals in their habitat.
  - Stop hunting of animals facing extinction.
  - Protect the animal's habitat from pollution.
  - Prevent the sale of animal fur for fashion garments.

Guided Practice

- In groups, the students should discuss how we can take care of our natural resources.
- Help them suggest at least five ways.

Independent Practice

Give each student a sheet of A4 paper on which to draw a picture of one of the endangered or extinct animals for a classroom display. Ask them to list the physical features, diet, and habitat of the animal they have chosen.

Wrap Up

Discuss the various factors that are leading to some animals becoming extinct.

Homework/Going further

The students should find out about the habitats of tiger, giant panda, and the rhinoceros, and find out why these animals are facing extinction.

Lesson Plan 3 — Student Book Pages 78–79

Learning Outcome

The students should be able to:

explain how we can help improve our environment by reducing our use of things, and re-using or recycling them.

Introduction

Ask the students to bring to the lesson an empty cold drink bottle, an empty jam jar, and one old newspaper.

Talk about some of the things that the students throw away after using once, for example, plastic bottle, tissues, plastic glasses, plastic forks, spoons, and plates, ice cream tubs, plastic bags, Styrofoam packaging, and even plastic toys.

Main Teaching

- The students should read pages 78–79 of the Student Book.
- Explain that in order to keep our environment clean we have to reduce waste by re-using things, or recycling them (making new things out of the old). We have to remember the three 'Rs '.
- Talk about how we can reduce the number of things we buy. Ideas might include:
  - Use cloth bags to carry our shopping instead of plastic bags.
  - Use cloth napkins at the dinner table instead of paper napkins or tissues.
  - Use dusters for wiping and cleaning things instead of wipes.
  - Use steel spoons and plates in the picnic basket. Do not use plastic straws for drinking cold drinks.
- Discuss ways to re-use many of the things that we buy. Ideas may include:
  - Jam jars, and biscuit tins can be used for storage. Small pieces of paper can be used to make lists or write notes.
  - Vegetable and fruit peel and garden waste can be used to make compost for fertilising the garden or flower pots.
  - Use rechargeable batteries in toys.

- Donate old toys, books, and clothes to a charitable organisation.

- Recycle means to make use of old things. Glass can be recycled by using the raw material from the used glass to make new glass items.
- Paper can be shredded and made into pulp, and re-used to make paper again.

Guided Practice

Divide the students into groups. Some groups of students can decorate the empty jam jars to turn them into pencil holders or vases. While some can use the old newspapers to make shopping bags. Paint colourful designs on the bags to make them look attractive.

Independent Practice

The students can make a collage using coloured pictures from old magazines. They should draw a picture on their art pad. Instead of using paints, they will cut the coloured pictures into small pieces like a mosaic and stick them in the required places on their drawings.

Wrap Up

Ask the students to display and discuss their independent projects.

Homework/Going Further

Name the 3 R's. What will happen to the environment if we do not follow them?

Lesson Plan 4 — Student Book Pages 80–81

Learning Outcome

Students should be able to:

Understand the effects of Deforestation.

Introduction

Talk about forests, what is found in a forest, and why it is important to have areas which are forested.

Main Teaching

- Show the students pictures of forests and jungles which have not been destroyed. At the same time show pictures of some areas of forest which have been used to build houses, farms, and roads.
- The students should read pages 80 and 81 of the Student Book. Explain that forests and trees in general are the lungs of the planet. Trees produce the oxygen which we need to breathe. Trees provide homes for birds, insects, and small animals. The roots of the trees keep the soil damp and hold it in place. The wood of trees is used to make furniture, houses, doors, and windows. In places where gas is not available, wood is used as fuel. Trees provide us with food. Trees bring us rain and remove the harmful carbon dioxide from the environment.
- Compare the two pictures on pages 80 and 81. Ask how each picture makes them feel, and why.
- Explain that deforestation is caused when forest areas are cleared to build homes and roads and for farmland. When the trees are cut down many birds and animals lose their homes. The soil in the forest dries up and nothing grows on it.

- Explain that Pakistan had extensive forests which have been destroyed by cutting down the trees for firewood and building material. Deforestation has led to many problems such as land slides in the mountain areas and flooding of the rivers. If forests are destroyed, those areas will turn into dry deserts.
- Ask the students to suggest how we can avoid deforestation. For example, by not cutting down trees, not wasting paper and recycling used paper, by planting more trees to replace the ones which have been cut down, and making sure that we try to re-use and recycle products.

Guided Practice

Ask the students to work in pairs and list the ways in which trees help us to keep our environment clean.

Independent Practice

Ask the students to attempt the Discuss and Answer on page 79.

Wrap Up

Ask the students to answer the following questions in their notebooks:

- Recap the different ways in which we use wood.
- Why is deforestation a problem for humans?
- How do forests help the environment?
- Give two ways in which deforestation can be reduced.

Homework/Going further

The students should answer Question 1 on page 82

Worksheet 11-1

Q1. a. Write 5 lines about the environment in your city.

b. Write 5 lines about the environment in a village.

Q2. Draw a poster to create awareness that endangered animals must be looked after by taking care of their habitats. They must not be hunted for their meat, skin, or tusks.

Worksheet 11-2

Q1. Draw a poster emphasising the importance of keeping our surroundings clean.

Q2. Fill in the blanks.

1. An area of land with many trees is known as a _____.
2. Trees provide homes for _____ and _____.
3. Oxygen is produced by the _____.
4. List four ways in which we use wood.

   a. _____ b. _____

   c. _____ d. _____.
5. When many trees are cut down in a forest it is known as _____.
6. Suggest two ways in which deforestation can be reduced.

   a. _____. b. _____.

In this unit the students will learn about the shapes of Earth, Sun, Moon, and Stars. The students are already aware of the fact that the Sun provides us with light during the day and that it is a source of heat as well. The Earth rotation around on its axis gives us the day and night. The Earth at the same time is also revolving around the Sun to give us the four seasons. The Moon revolves around the Earth. It reflects the light of the Sun at night. Discuss about space travel and about the first man on the Moon.

Unit 12: The Earth, Sun, Moon, and Stars

Lesson Plan 1 — Student Book Page 85

Learning Outcomes

The students should be able to:

- explain how the Earth orbits the Sun.
- explain that it takes one year for the Earth to orbit the Sun.

Introduction

- Show the students a football and a table tennis ball and explain that the larger represents the Sun, and the smaller represents the Earth.
- Explain that they are going to learn about the movement of the Earth in space.
- Introduce the term sphere to describe the shape of the balls.

Main Teaching

- Explain that the Sun is hot because it is made up of hot gases which are still burning. The Sun is the source of heat and light for the Earth. The Sun is the star which is closest to the Earth; the other stars are very far away, that is the reason we can only see them twinkling at night.
- Show them the two balls again and point out that the Sun is much larger than the Earth. It looks smaller because it is very far away from the Earth.
- Stress that they must never look at the Sun directly, because it can damage the eyes.
- Explain that the Earth is a planet and it orbits, or goes around, the Sun. Demonstrate this movement using the two balls.
- It takes one year or 365 days to complete this orbit. The movement around the Sun gives us the four seasons. Ask the students to name the four seasons and talk about the differences between them.

Guided Practice

- Ask the students to work in groups and give each group four six inch square cards.
- One group should draw different ways we dress during the four seasons; the second group should draw the food we eat in each season; the third group should draw the flowers we can see in the garden in each season; the fourth group should draw the different fruits of each season; the fifth group should draw playful activities in each season.
- Display the picture mosaic of the four seasons on the soft board.

Independent Practice

Find out in which months we have spring, summer, autumn, and winter.

Wrap Up

Recall the lesson by asking:

1. What is the shape of the Sun and the Earth?
2. Is the Earth a planet?
3. Is the Sun a planet or a star?
4. Does the Earth revolve around the Sun?
5. What is the name given to the path the Earth takes?
6. What causes the seasons?

Homework/Going Further

The students should fill in the blanks to complete the sentences.

1. The round shape of the Earth is known as a _____.
2. The Earth is a _____.
3. The Sun is a _____.
4. The Sun is very _____ from the Earth.
5. The Sun is made up of hot, burning _____.

Lesson Plan 2 — Student Book Page 85

Learning Outcomes

Students should be able to:

- explain that the Earth rotates to the east on its axis once every 24 hours.
- explain that while one side of the Earth has day, the other side has night.

Introduction

Recall the previous lesson when the students learned that the Earth orbits the Sun and this movement causes the seasons. Explain that in this lesson they will learn about the movement of the Earth on its axis in the east-west direction which gives us day and night.

Main Teaching

- Ask three students to come in front of the class. One student will be given the football, which is the Sun. The second student will be given the tennis ball, which is the Earth. The third student will be given the table tennis ball which is the Moon. The Sun will remain standing in one place. The Earth will rotate while moving slowly around the Sun. At the same time the Moon will revolve around the Earth.
- Remind the students that the Sun does not move; it is stationary. The Earth revolves on its axis, which is an imaginary line in the centre of the Earth. When a part of the Earth faces the Sun, it is bright and it is day. On the other side of the Earth it is dark, and it is night. This movement of the Earth is in the east-west direction. This is the reason that the Sun always appears to rise in

the east and set in the west. It takes twenty-four hours for the Earth to spin on its axis.

- Place a globe and a torch on the teacher's table. Rotate the globe slowly, while shining the light on it. The part of the globe on which the light shines will have light or daytime, while on the other side it will be dark or night time.

Guided Practice

In groups, the students should attempt the Discuss and Answer on page 86.

Independent Practice

The students should draw a diagram of the demonstration with the globe and torch in their notebooks.

Wrap Up

Recall how day and night occur. Describe the two movements of the Earth and say which gives us day and night.

Homework/Going Further

The students should answer these questions in their notebooks:

1. In which direction does the Earth rotate?
2. How long does the Earth take to rotate once on its axis?

Lesson Plan 3 — Student Book Page 86

Learning Outcomes

The students should be able to:

- explain that the Moon is a sphere and it goes round the Earth.
- explain that the light of the Moon is the reflected light of the Sun.

Introduction

Talk about the Moon and how its shape changes throughout the month. Explain that they will learn more about the Moon in this lesson.

Main Teaching

- Put up an illustration showing the Moon revolving around the Earth and the various phases of the Moon as it changes during one month.
- Read page 86 of the Student Book with the students. Explain the following facts about the Moon.
- The shape of the Moon, like that of the Earth, is a sphere.The Earth is fifty times bigger than the Moon. The Moon is called a satellite of the Earth because it revolves around the Earth.The Moon also spins on its own axis.
- From Earth, we can only see one side of the Moon. The Moon takes the same time, 28 days, to spin on its axis as it takes to revolve around the Earth. The Moon does not have its own light: it reflects the light of the Sun.

- The surface of the Moon is not flat: it has many craters which have been made by meteors crashing onto its surface.
- The Moon is seen in different phases throughout the month. This is because when the Moon rotates around the Earth, only the part of the Moon which receives sunlight is visible to us. A full moon occurs on the 14th of each lunar month. The new moon, which can be seen on the 1st of each lunar month, is known as a crescent moon.
- There is no air on the Moon and it has very little water. There is no life on the Moon.
- The first man to walk on the Moon was Neil Armstrong, an American.
  Some countries have built space ships to travel into space. The people who travel in these space ships are known as astronauts. The astronauts have to wear a space suit which is fitted with an oxygen supply as there is no air in space.

Guided Practice

The students should answer Question 1 on page 87.

Independent Practice

- The students should do the Concept Check on page 87.
- The students should answer Question 2 on page 88.

Wrap Up

Ask questions about the Moon such as: *What is the shape of the Moon? Why is there no life on the Moon? Do we see the same phase of the Moon throughout the month? What is an astronaut? What helps him/her to breathe in space?*

Homework/Going Further

The students should answer the following questions.

1. Why is the astronaut in the picture on page 87 wearing a space suit?
2. Does the Moon move around the Sun?
3. Who was the first man to walk on the Moon?

Worksheet 12-1

Q1. Draw pictures to show the four seasons.

Spring	Summer
Autumn	Winter

Worksheet 12-2

Q1. Draw two diagrams. The first should show how the Earth revolves around the Sun. The second should show how the Earth rotates on its axis.

The Earth revolving around the Sun, gives us the four seasons.

The Earth spinning on its axis gives us day and night.

Worksheet 12-3

Q1. Draw a crescent moon, a half moon, and the full moon.

Answers

Unit 1

Concept Check

Fill in the blanks.

1. The skeleton of an adult is made up of **206** bones.
2. You need **muscles** and **joints** to move your bones.

Exercises

1. Choose the correct answer.
   i. What do we call the place where bones meet? **c. joint**
   ii. Which of these is the name for the bones in the head? **b. skull**
   iii. Which of these is NOT one of the five senses? **b. belief**
   iv. Which is the odd one out? **d. skin** (The others are bones.)
   v. Which part of the body is used to breathe with? **c. lungs**
2. **i. middle finger 2**
   ii. thumb 1
   iii. arm 2 (unless they try to include all the joints in the hands too!)
3. Which bones protect the following important organs? i. heart and lungs **ribs** ii. nerves in the spine **spine/back bone** iii. brain **skull**
4. Answer these questions.
   i. What is a skeleton? **All the bones of our body make up our skeleton.**
   ii. Why do we need muscles and joints? **Muscles and joints help the skeleton to move.**
   iii. What would happen to the body if it did not have a skeleton? **Answers will vary.**
   iv. a. heart **– pump blood to all parts of the body** b. brain **– enables us to think/ remember, controls the body** c. lungs **– enable us to breathe** d. stomach **– enables us to digest food**
   v. **sight, smell, taste, hearing, touch**
   vi. **eyes, nose, tongue, ears, skin**
5. **A range of responses is possible in many cases; ask them to (verbally) explain their choice when you review or discuss the answers.**

   action/item organ/sense

   perfume **nose/smell**

   sunshine **skin/touch, eyes/sight (Do not look directly at the Sun.)**

   soap **nose/smell, skin/touch, eyes/sight**

   pickle **tongue/taste, nose/smell, eyes/sight**

   drumming **ears/hearing, skin/touch, eyes/sight**

   sunset **eyes/sight (Do not look directly at the Sun.)**

   sandpaper **skin/touch, eyes/sight**

clouds **eyes/sight**

singing **ears/hearing**

fur **skin/touch, eyes/sight**

banana **tongue/taste, eyes/sight, nose/smell**

Unit 2

Concept Check

Fill in the missing words. The first letter of each word has been given to you.

To stay alive and healthy, your body needs plenty of fresh **air**, clean **water,** and healthy **food**. Your body also needs **rest** and **exercise**.

Concept Check

Fill in the blanks using 'Always' or 'Never' so that the rules are clear!

1. **Never** look directly at the Sun.
2. **Never** run with scissors.
3. **Always** wash your hands before eating.
4. **Never** swim alone.

Exercises

1. Choose the correct answer.

i. Which of these are ways to look after your body? **d. all of the above**

ii. Which of these is not a healthy food? **d. French fries**

iii. Which of these is not safe? **a. running with scissors**

iv. We should not eat berries from plants we do not know because they might **a. be poisonous.**

v. Why should we follow rules? **b. They keep us safe.**

2. Answer these questions. **Answers will vary. Share and discuss.**
   i. What do our muscles need in order to work?
   ii. Why should we not tease animals?
   iii. Why is it important to wash our hands before eating?
   iv. How might loud sounds harm us?
   v. In what ways is an electric kettle dangerous?
3. Talk about the picture. Tell your teacher about the dangers in a city. **Responses will vary. Share and discuss.**
4. Choose the correct word from the brackets to fill in the blank.

i. junk **ii. 6 to 8** **iii. strong** **iv. healthy**

Fun pages

1. **Ensure that the pupils put the parts of the skeleton in their correct places in the outline diagram.**
2. **Prepare the required equipment in advance and help any pupils who might struggle by copying and enlarging the body parts in advance.**
3. **LUNGS HEART SKELETON BRAIN JOINT**
4. Colouring activity. **Discuss the meaning – they should understand the importance of checking or thinking before acting.**

Unit 3 Plants and their Parts

Concept Check

Are these statements true or false?

Put a T or F next to each one.

1. **T** 2. **T** 3. **F** 4. **T**

Exercises

1. Choose the correct answer.
   i. Which of these is a type of herb? **d. coriander**
   ii. Which of these is NOT a fruit? **d. radish**
   iii. Which of these is a seed? **d. orange pip**
   iv. Which of these fruits grow on trees? **c. mango**
   v. What does the stem carry to other parts of the plant? **c. water and food**
2. Fill in the blanks.
   i. **Trees** are the biggest plants.
   ii. **Shrubs** are small plants with stems that are hard and difficult to bend.
   iii. A **cactus** has a thick, fleshy stem and prickly spines.
   iv. All **plants** need sunlight, air, and water to **grow**.
   v. **Creepers** are plants with weak stems which grow along the ground.
3. Find out if the following is a tree (T), shrub (S), herb (H), or climber (C).
   tamarind **T,** bougainvillea **SC,** jasmine **SC,** cedar **T,** hibiscus **S,** mulberry **T,** neem **T,** peepal **T,** pea **C,** apricot **T,** grapevine **C,** rose **S,** mint **H,** sunflower **plant**
4. Name each fruit. Then match the seeds with the fruits.
   i. **apple b** ii. **apricot a** iii. **grapes e** iv. **lemon c** v. **mango d**
5. Choose any plant from a garden.
   Draw a picture of it in your notebook, along with separate sketches of its leaf, fruit, and flowers (if any). Write a short description of the plant. Can your friends guess the name of the plant?
6. Why should we not eat the parts of some plants? **They may be poisonous.**
7. Give short answers.

i. Which part of the plant tells us the age of a tree? **rings in the trunk**

ii. Which has a thicker skin, a plum or a mango? **mango**

iii. Is a lemon more sour than an orange? **yes**

iv. Which has more seeds, a pomegranate or a papaya? **Discuss and vote. Experiment to check if you have the time and resources. Both have a lot of seeds.**

v. Do all flowers become fruits? **no**

Unit 4 Uses of Plants

Concept Check

1. How many plants can you name? Make a list. Then compare it with your classmates' lists.
2. Complete each sentence using a word beginning with F.
   i. Jute and cotton are types of **fibres**.
   ii. Plants provide **food** for animals and humans.
   iii. Some plants produce **flowers** which we use for decorations on special occasions.
   iv. We eat different parts of plants such as: **fruit**, nuts, roots, stems, leaves, and seeds.

Exercises

1. Choose the correct answer.
   i. Which of the following is used to make cooking oil? **d. sunflower**
   ii. Which of these is NOT a root vegetable? **d. cucumber**
   iii. Pick the best answer to complete the sentence. Compost is used as a fertiliser for growing plants. It is made of **a. dead plant materials.**
   iv. Which of the following does NOT come from a plant? **b. eggs**
   v. We should eat fruits and vegetables because they are **b. full of vitamins and minerals.**
2. Which parts of these plants do we eat?
   i. tomato plant **fruit** ii. cabbage **leaves** iii. pea **seeds**
   iv. turnip **roots** v. lettuce **leaves** vi. carrot **roots**
3. Find the odd one out in each list. Tell your teacher why it is the odd one out.
   i. banana **– It is a fruit; the others are root vegetables.**
   ii. lime **– it is a fruit, the others are nuts.**
   iii. peanut **– it is a nut (a legume), the others are fruits.**
   iv. tea rubber coffee cocoa lime **– discuss answers: they may pick lime because it does not need to be changed (processed) to be used, they may choose rubber because it is not consumed.**
4. Put the things below in the correct columns.

   Made from plants: tomato sauce, eraser, cotton handkerchief, perfume

   Not made from plants: marble, pen, bat, ball, ring, cup, book, tap, gate, comb
5. Make a list of ten useful things you have at home that are made from wood. Did your friends write the same things in their lists? Find out. **Discuss. Ensure that the pupils**

understand that items can be made from different materials. For example, a chair can be made of wood, metal, or plastic, and the comb in 4 is made of plastic, but a wooden comb would be made from a plant.

6. Can you join these names to the correct vegetable basket?

   root vegetables **beetroot, carrot, spring onions**

   stems **sugarcane**

   seeds **pulses/peas/beans chickpeas**

   grains **rice, wheat**

   leaf vegetables **lettuce, spinach**

   fruits **brinjal, tomato**

7. Tell your teacher:
   - how do you use flowers at home. **Responses will vary. Share and discuss.**
   - what is paper made of. **Trees – revisit the explanation on page 19.**

Unit 5 Animals

Concept check

Swan/cygnet frog/tadpole bear/cub cat/kitten fish/fry horse/foal

Exercises

1. Choose the correct answer.
   i. Which of these would be useful for a wild animal that eats deer? **d. all of the above**
   ii. Which three of these can come from hen? **a. meat b. eggs c. feathers**
   iii. Which of these animals is a scavenger? **c. vulture**
   iv. Which of these have webbed feet? **a. ducs**
   v. Which of these is a wild animal? **c. bear**
2. Fill in the blanks using the words in the box.
   i. We get silk from a **silkworm**.
   ii. A **cat** is kept as a pet. It catches mice.
   iii. A **hen** lays eggs.
   iv. We get wool from **sheep**.
   v. Frogs and fish are similar because both lay **eggs** in water.
3. Look at the picture and complete the fact file about frogs below, using the correct words and phrases from the brackets.
   i. A frog lives on **land and water**.
   ii. It has **four** limbs.
   iii. Its skin is **bumpy and wet**.
   iv. It **does not have** a neck.
   v. It eats **flies**.
   vi. It **croaks**.
   vii. Baby frogs are called **tadpoles**.

4. Now make a fact file on the butterfly. You can also collect pictures of different types of frogs, fish, and butterflies and make a display in your classroom. **Display and celebrate effort.**
5. Name the following.
   i. an animal with a hump on its back **camel (some kinds of cattle)**
   ii. an animal with horns **answers may vary – some possible responses: cow/bull, rhino**
   iii. an animal with claws **answers may vary – some possible responses: birds, cats**
   iv. an animal with tusks **answers may vary – some possible responses: elephant, walrus**
   v. an animal with fur **answers may vary – most mammals - some possible responses: cats, dogs, rabbits, monkeys**
6. Look at the pictures on page 33 and match the following.
   i. trunk **c. for grasping, breathing, and producing sound**
   ii. fur **d. for keeping warm**
   iii. fin **b. for sliding through the water easily**
   iv. horns **a. for fighting**
   v. tail **e. for balancing on branches**
7. What are the following parts used for? Think carefully. There may be more than one use for each.

   Answers will vary but here are some ideas:

   Birds:
   i. claw **perching, holding, tearing, scratching the earth**
   ii. feather **decoration, hiding (disguise/camouflage)**
   iii. tail **balance, decoration, flight**
   iv. beak **feeding, cleaning, fighting, carrying things**
   v. wing **flight, balance, decoration**

   Fish:
   i. gill **breathing**
   ii. scale **decoration, hiding, protection**
   iii. tail **swimming, steering, fighting**
   iv. fin **swimming, steering**
   v. mouth **feeding, fighting**
8. **Drawing task. Display and celebrate.**
9. Write the names of these animals in the correct columns of the table below.

   We live in water **shark, goldfish, tadpole, eel, crab, whale, seahorse, octopus, lobster, snake**

   We do not live in water **lizard, rabbit, butterfly, crab, scorpion, rat, orangutan, jackal, snake, fly nightingale, centipede**

Some animals appear in both lists.

Fun pages

1.

C	Y	O	L	X	Z	L	D	O	K	B	X
R	R	B	M	B	X	R	T	G	P	X	E
D	R	Q	T	P	Q	K	P	N	K	V	H
D	E	T	R	E	F	W	Z	A	E	E	D
P	B	V	B	A	A	Q	Z	M	P	E	G
E	E	M	A	R	A	Y	A	P	A	P	R
A	U	E	N	H	K	P	I	P	X	S	A
C	L	L	A	P	R	I	C	O	T	H	P
H	B	O	N	H	C	X	Q	O	L	H	E
E	G	N	A	R	O	Q	J	W	F	E	S
H	G	U	A	V	A	X	R	O	V	K	G
R	S	D	E	L	P	P	A	P	L	G	L

2. Drawing activity. Share and celebrate.
3. **HIMALAYAN CEDAR**
4. Drawing activity. Discuss labelled parts. Share and celebrate.
5. **cat, horse, duck, dog, crow, goat**

Unit 6 Solids, liquids, and gases

Concept Check

Fill in the blanks using the words in the box.

1 Frozen water is called **ice**. Ice is **solid**.

2 When **water** is heated it becomes vapour. Water is **liquid**.

3 Water, wood, and rocks are **natural resources**.

Exercises

1. Choose the correct answer.
   i. Which of these is a natural resource? **a. rocks**
   ii. Which of these is a man-made material? **d. paper**
   iii. Which of the following is used for making glass? **a. sand**
   iv. Which of these is NOT man-made? **d. rock**
   v. Which of these is an expensive precious stone? **b. ruby**

2. Mark these sentences with × or ✓.
   i. All materials around us are either a solid, a liquid, or a gas. ✓
   ii. Rocks can be blown up with dynamite. ✓
   iii. Plastic is found underground. ×
   iv. Jute is a type of fibre. ✓
   v. Wool comes from animals. ✓
3. Answer these questions.
   i. Which things are made of glass? **Answers will vary but here are some ideas: bottles, windows, glasses, lenses, vases.**
   ii. Name three things made out of plastic. **Answers will vary.**
   iii. Name three things made from natural materials. **Answers will vary.**
   iv. What does ice turn into when it melts? **water**
   v. How can we change water into a solid? **freeze it**
4. From which materials might these things be made? (Remember that some of the things can be made from more than one material.) **Try to look at some examples in class.**

   belt **– leather, plastic, fibre, metal**

   shirt **– cotton, silk, polyester, plastic buttons**

   clock **– metal, plastic, wood, glass**

   pencil **- usually wood and graphite**

   tyre **– rubber (with metal and plastic parts)**

   vase **– glass, plastic, clay**
5. Put five things under each heading in the table below. **Answers will vary. Discuss.**
6. Make a collection of solids and liquids. Record your observations in a table like the one below. **Answers will vary.**

Unit 7 Measuring instruments

Concept Check

Answers will vary. Discuss.

Concept Check

What would you use to measure the following?

a length of cloth: **metre rod or measuring tape**

the time it takes to run a race: **stopwatch**

a person's weight: **weighing scales**

the amount of oil in a tin: **measuring cup or beaker**

the temperature of a drink: **thermometer**

Exercises

1. Choose the correct answer.

i. To check your temperature, a doctor will use a **a. thermometer.**
ii. To weigh out ingredients when making a cake, we use **c. kitchen scales.**
iii. What ingredients are used to make lemonade? **d. water, lemons, and sugar**
iv. How many hours are there in a day? **c. 24**
v. Which of these could you measure in a measuring beaker? **d. all of these**

2. Choose the correct answers and fill in the blanks.
   i. I will use a **ruler** to measure the length of my book.
   ii. My mother wears a **watch** on her wrist.
   iii. A large full jug holds **more** water than a full glass.
   iv. The **kitchen scale** is used to measure how much sugar to put in a cake.
3. Match the following:

   thermometer - temperature **bathroom scale - weight** **clock - time**
   measuring tape - length **beaker - liquid**

Fun pages

1. **iii.**
2. **i. a, b. ii, c. iii**
3. T E R R I M I T U N D **L I V I N G** I S A L O T A N A Z U F E L I F
   O X Y G E N A T U P O R E **L E A T H E R** S E N D O R I F I B R E X T R
   E T A M A S I N **R O C K E T** I N G A R O **L I Q U I D A T I O N** I Z E X
4. **Enjoy the smoothies!**
5. **Share some simple recipes. If you can, make some things in class using simple recipes.**

Unit 8 Electricity

Concept Check

The torch and remote controls use cells/batteries.

1. Choose the correct answer.
   i. Which one of these things use mains electricity? **a. television**
   ii. It is very dangerous to **d. poke something into an electric socket.**
   iii. Your remote-controlled car is not working. It needs **c. a battery.**
   iv. Which one of these things is usually powered by a battery? **a. torch**
   v. Electricity is sent from power stations to homes through **b. cables.**
2. Answer the following questions.
   i. What is an inventor? **the first person to make or think of a particular thing**
   ii. Who invented the first electric light bulb? **Thomas Edison**
   iii. Where does the electricity we use come from? **through cables from a power station**
   iv. Why can small batteries not be used to work a big electrical object? **They do not contain enough electricity.**

v. Write the name of one object that works with a battery and one that works by mains electricity. **Answers will vary.**

3. Make a list of things that you can find in your home or school which use electricity. **Answers will vary. Discuss.**

4. Tell your teacher

   i. how to stay safe around electricity. **Answers will vary. Discuss.**

   ii. about something you use which works using electricity. **Answers will vary. Discuss.**

Unit 9 Light and Shadow

Concept Check

Look at these pictures and answer the question below. Who can see the book more clearly? Why?
b. He is closer to the light and the light is shining directly on his book.

Concept Check

1. Fill in the blanks.
   a. Shadows are made when light is **blocked** by an object.
   b. Light cannot pass through most **solid** objects.
   c. Smooth, shiny objects **reflect** more light.
2. Look at these objects and place them in the correct columns below. The first one has been done for you.

   man-made source of light **mobile phone screen, traffic lights, electric lamp, candle, match, lantern**

   natural source of light **the Sun, star, fire-fly**

   Source of reflected light **the Moon, metal tray, mirror**

Exercises

1. Choose the correct answer.
   i. Light travels in straight lines. These are called **b. rays.**
   ii. How is a shadow formed? **a. when light is blocked by an object**
   iii. The type of surfaces which reflect more light are **b. smooth and shiny.**
   iv. Which of these can light pass through? **b. glass window**
   v. Which statement is correct? **a. An object close to a light makes a big shadow.**
2. Answer these questions.
   i. How are shadows made? **when light is blocked by an object**
   ii. What are straight lines of light called? **rays**
   iii. Name the main source of light. **the Sun**
   iv. Through which kinds of objects can light not pass? **most solid objects**
   v. Is a light more intense when you are close to the source or far away from it? **close**
3. When a light source is close to an object, is the shadow small or big? **big**

4. Draw the shadows. **Answer can be found in the book.**
5. You learnt that light cannot pass through some materials. We call such materials opaque. Make a list of ten objects in your classroom that are opaque. **Answers will vary. Discuss.**
6. Make a list of five things that light can pass through and five things that reflect light. Find out what other pupils wrote. **Answers will vary. Discuss.**

Fun pages

1. Mixed up words. Unscramble the letters.

   ELECTRICITY INVENTOR BULB BATTERY
2. Draw a line to connect the lamp to the power supply. **Answer to be given by students.**
3. Colouring activity.
4. Creative activity.
5. Riddle

   In a square room, there are 20 people. They cannot move their head or body, only their eyes, but all of them can see all the others in the room and every part of the room.

   Where can you place an apple so that everyone in the room can see it apart from only one person? **On top of one person's head.**

Unit 10 Water

Exercises

1. Choose the correct answer.
   i. Which of the following is NOT a way to store water? **b. paper bag**
   ii. Which of these is NOT a form water can take? **d. salt**
   iii. Which of these things need water to survive? **d. all of these**
   iv. Which one of these statements is correct? **c. Rivers flow to the seas and oceans.**
   v. Which of these is not a way to get water from underground? **d. canal**
2. Choose the right word to complete the sentences.
   i. We block flowing rivers with ___. **b. dams**
   ii. Water comes to the surface in some places at a natural ___. **c. spring**
   iii. Rainwater sometimes ___ into the Earth. **c. sinks**
   iv. Seawater is _____ . **a. salty**
3. Think about it!

   How do we get water to the surface from deep under the surface of the Earth? Talk about this in class.

4. Answer these questions. **Talk about wells, springs, pumps.**
   i. Why must we always drink clean, and fresh water? **Dirty water can make us ill.**
   ii. What happens to rainwater when it falls on the Earth? **It sinks into the ground or flows away.**
   iii. Where do we store water? **Tanks, bottles, reservoirs, behind dams, etc.**
   iv. How many glasses of water do you drink in a day? a. in the summer? b. in the winter? **Answers will vary. Advise them that they should drink 6 – 8 glasses of water every day (and more in the summer).**
5. Make a list of the ways in which you use water. Compare your list with the lists of others in class. Talk about the uses and how to use water responsibly. **Answers will vary. Ensure they understand that water should not be wasted.**

Unit 11 The Environment

Concept Check

Unscramble these words. The first letter of each word has been underlined. Do you know what they mean? **Discuss meanings.**

recycle deforestation desert environment

Exercises

1. Choose the correct answer.
   i. Which of these is NOT a natural resource? **d. wheels**
   ii. How many trees did Pakistan pledge to plant by August 2018? **a. 1.4 million**
   iii. Which of these animals is in danger of becoming extinct? **b. panda**
   iv. Which of these is a natural resource? **a. coal**
   v. Which of the following is NOT a way to reduce the amount we throw away? **a. Buy things you do not need.**
2. Answer in your own words.
   i. Write about something found in your environment that you like. **Answers will vary.**
   ii. Name three things that spoil the environment. **Answers will vary.**
   iii. Name the three R's. What could happen to the environment if we do not follow them? **Reduce, Reuse, and Recycle. Our environment will become dirty and it will be harmed.**
3. Tell your teacher two ways in which we can reduce deforestation. **Collect the pupils' responses and refer to the list on page 81.**
4. Make a list for why we need trees, including the ways in which trees are used by humans and animals. **Answers will vary. Ensure that they include the response that trees produce the air we breathe.**

Fun page

1. Complete the crossword with words from the chapter about water.

			W	A	T	E	R				
	R	E	S	E	R	V	O	I	R		
					L	A	K	E			
						P	U	D	D	L	E
						O	C	E	A	N	
				S	T	R	E	A	M		
				S	E	A					
						T	A	N	K		
					W	E	L	L			

2. What a water puzzle!

   There are three jars which can hold exactly 3 litres, 5 litres, and 8 litres of water. The first two jars are empty, the third contains 8 litres of water. By pouring water from one jar to another make at least one of them contain exactly 4 litres of water. Can you do it? How will you find out without experimenting? Instead of jars and water, what can you use?

Discuss and try out their ideas.

Show them how to solve it.

Fill up the 5-litre jug. Fill up the 3-litre jug with the water from the 5-litre jug.

Pour the water from the 3-litre jug back into the 8-litre jug. Pour the remaining 2 litres of water from the 5-litre jug into the 3-litre jug.

You now have 2 litres of water in the 3-litre jug, an empty 5-litre jug, and 6 litres of water in the 8 litre jug. Next: Fill up the 5-litre jug again from the 8-litre jug. Pour water from the 5-litre jug into the 3-litre jug (which already holds 2 litres) until it is full. You now have 4 litres of water in the 5-litre jug!

Concept Check

Write T by the true statements and F by the false one.

1. The Sun is huge but it looks small because it is far away. **T**
2. The Moon is fifty times bigger than the Earth. **F**
3. The path of the Earth through space is called its orbit. **T**
4. The Earth takes a year to travel round the Sun. **T**

Exercises

1. Choose the correct answer.
   i. Complete this sentence. The Earth spins to the **c. east.**
   ii. How long does the Earth take to travel around the Sun? **c. a year**
   iii. Which one of these statements is false? **d. The Earth is bigger than the Sun.**

iv. Which of the following is the most accurate statement about the Sun? **b. It is round and made of hot, burning gases.**

v. The Earth, the Sun, and the Moon are all **a. spheres.**

2. Correct the statements that are false.

i. There is no water on the Moon.

ii. There is **no** air on the Moon.

iii. The light of the Moon is reflected sunlight.

iv. The Moon is called a ~~planet~~ **satellite**.

v. The Moon is ~~bigger~~ **smaller** than the Earth.

3. Answer these questions.

i. In which direction does the Earth spin? **towards the east**

ii. How long does the Earth take to spin round once? **24 hours**

iii. Why is the astronaut in the picture on page 87 wearing a space suit? **Because there is no air on the Moon. Pupils may know a little about the different conditions on the Moon which they can also discuss.**

iv. Does the Moon move round the Sun? (Think carefully.) **The Moon moves around the Earth which is moving around the Sun, so yes, it does.**

v. Who was the first man to walk on the Moon? **Neil Armstrong**

4. Look at a globe or a map of the world. Find all the continents. These are large areas of land. Is there more land or more sea on the surface of the Earth? **There is more sea than land.**

5. When and where did you last see a full moon and a new moon? Tell your teacher.

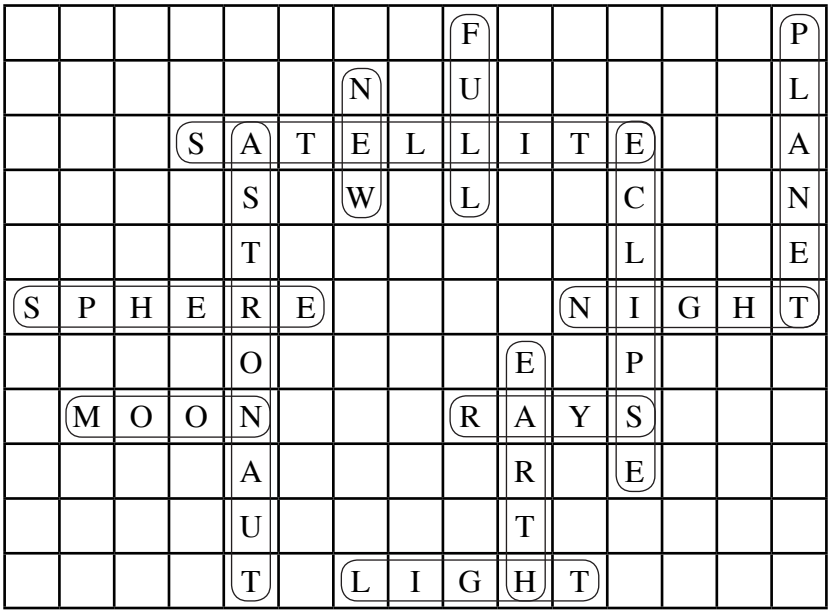
Answers will vary. You can look up the dates of the next full moon and new moon so that the pupils can look out for them.

Fun page

1. Complete the table below by marking a × or a ✓ in the boxes:

Feature	The Earth	The Moon
air	✓	×
water	✓	×
life	✓	×
sphere shaped	✓	✓
orbits a bigger object	✓	✓
is a planet	✓	×

2.


F P
N U L
S A T E L L I T E A
S W L C N
T L E
S P H E R E N I G H T
O E P
M O O N R A Y S
A R E
U T
T L I G H T

Sample Assessment Paper

Maximum marks: 50 1st term Examination Time Allowed: 1h 30 min

Q1. Answer the following questions. [10]

a. What gives our body a shape and helps us to stand? _____

b. What organ of the body pumps blood to all the parts of the body? _____

c. How does our body get energy to do work?_____

d. Name two small types of plants._____

e. What is name given to the shape of the Earth?_____

f. In which direction does the Earth spin._____

g. What instrument do we use to check the temperature?_____

h. Where is Mains electricity produced?_____

i. What is the main source of light?_____

Q2. Circle the correct answer. (5)

a. We must (always tease animals, never tease animals).

b. All fruits (have a skin, do not have skin).

c. The fins help the fish (to swim, dive) in water.

d. The sheep gives us (wool, silk) to make warm clothes.

e. We measure the weight of an object with a (weighing scale, measuring tape).

f. Mains electricity is produced by the (batteries, power station).

g. Light rays travel in (wavy lines, straight line).

h. We must (keep the water running, must not keep water running) when we wash our hands.

i. (panda, cows) are among the extinct animals of the world.

j. The Earth goes around the Sun in (24 hours, 365 days).

Q3. Fill in the blanks. (10)

a. All plants need _____,_____,_____, and _____.

b. Water is found in the three states of matter _____, _____,and _____.

c. The Earth spins on its _____, _____ hours.

d. Name two ways in which we use water. _____ and _____

e. Name three man-made materials _____,_____,and _____.

f. Name three natural materials _____,_____,and _____.

g. When light passes through an object, it is _____.

h. When light cannot pass through an object, it is called _____.

i. Name two rocks found under the surface of the Earth._____ and _____.

j. Name two natural fibers. _____ and _____.

Q4. Match the columns. (2,5)

S. no	Animal	S. no	Special body parts
1	Tiger	a	A long neck to reach leaves of tall trees.
2	Polar bear	b	A long trunk to pull branches of trees.
3	Elephant	c	A long tail to swing tree to tree.
4	Giraffe	d	Sharp teeth to kill animals for food.
5	Monkey	d	Thick fur to keep it warm in winter.

Q5. Draw and label the following parts of the plant. Roots, stem, flower, and leaves. (4)

Q6. Match the following. (2.5)

1. Muscles and joints	a. helps you to breathe.
2. Brain	b. helps you to move your limbs.
3. Stomach	c. pumps blood to all parts of the body.
4. Heart	d. controls your body and your actions.
5. Lungs	e. digests your food.

Q7. Fill in the columns with the sources of natural light and man-made light. (2)

Sources of natural light	Sources of man-made light

Q8. Write the names of the following animals in the correct column. (4)

lion, tadpole, shark, rat, butterfly, octopus, lizard, goldfish,

Animal that live on land	Animals that live in water

Q9. Write three ways in which we can keep our environment clean. (3)

1. _____
2. _____
3. _____

Q10. Write two ways in which we can reduce deforestation. (2)

1. _____
2. _____

Q11. Give the names of two flowers, leaves, seeds, stems, and roots that we eat. (5)

Flower	Leaves	Seeds	Stem	Roots

NOTES

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