SCIENCE
Teacher's Manual

Grade 3

Papua New Guinea
Department of Education

From
the People of Japan

JICA

QUIS-ME
We love Mathe and Science !
Department of Education & JICA

Issued free to schools by the Department of Education

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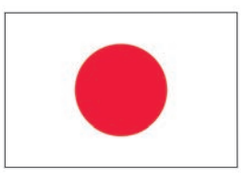


From
the People of Japan

Table of Contents

Secretary's Message

Dear Teacher,

I am aware that the teaching and learning of Science is a challenging experience in our schools today. Therefore it is my pleasure to inform all Grade 3 Teachers in our Primary Schools that a scoped and sequenced content-based curriculum resource, Teacher's Manual for Grade 3 Science has been developed to assist you in the delivery of quality, effective and meaningful Science lessons to the grade 3 students in our schools. The lessons are aimed at preparing and shaping our young scientists and equipping them with the relevant scientific skills for the 21st century.

This Teacher's Manual will facilitate the delivery of the science lessons prescribed in the National Science Textbook. It is designed to achieve the grade 3 content standards and benchmarks outlined in the syllabus. It promotes and maintains standard lessons for yearly, termly and daily teaching and learning activities for all teachers. It will help to guide teachers to plan and teach the Science lessons in line with the National Science Textbook. The Science syllabus for grades 3- 5 provides the curriculum content expanded in the Science Teacher's Manual and National Science Textbook respectively.

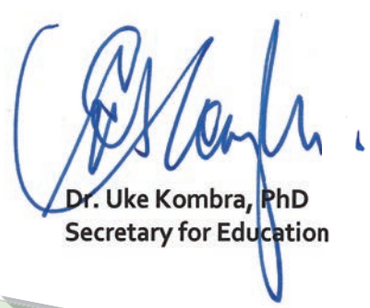
This Teacher's Manual guides critical thinking and problem solving approaches in which you can easily visualise concepts in the lesson flow, expanded in the textbook. The Teacher's Manual addresses areas of what to teach, how to teach and what to measure (assess). It is user friendly and reflects PNG contexts in daily situations to help students acquire key concepts; knowledge, skills, attitudes and values set out in the lesson objectives. Therefore, this Teacher's Manual was developed to guide all teachers with clear and precise step by step lesson flow and activity steps for all lessons and teacher notes to assist teachers' understanding of the science concepts.

This teacher resource was produced by the National Department of Education, in partnership with JICA our partners in global education. The development of these teacher and student materials took three years which started in 2016 and ended in 2019. I commend all personnel involved, science experts from Japan and the department's very own curriculum officers and textbook writers for the excellent work done.

You are encouraged to use this Teacher's Manual as a tool to effectively deliver the content of the textbook and other relevant resources such as science equipment recommended to generate creative teaching and interactive learning.

Teachers, Science can be fun if you tune in and engage with students in all the scientific ideas and concepts presented in the content of the lessons and activities that are in the textbook through this Teacher's Manual.

I approve this Teacher's Manual for Grade 3 Science to be used in all primary schools throughout Papua New Guinea.



Dr. Uke Kombra, PhD
Secretary for Education

1. How to use the Teacher's Manual

Teacher's Manual has been developed for teachers to teach learning contents to their students more effectively with using the National Science Textbook. As for the features of this Teacher's Manual, its contents correspond to that in the textbook according to the Grades 3-5 Science Syllabus. The syllabus sets the national standards that are taught by teachers in the classroom that all students should acquire throughout the country, regardless of the context. These standards outlined in the syllabus are reflected in this teacher's manual. Therefore, information in this teacher's manual will help teachers to prepare lesson plans and to conduct lessons in line with the syllabus.

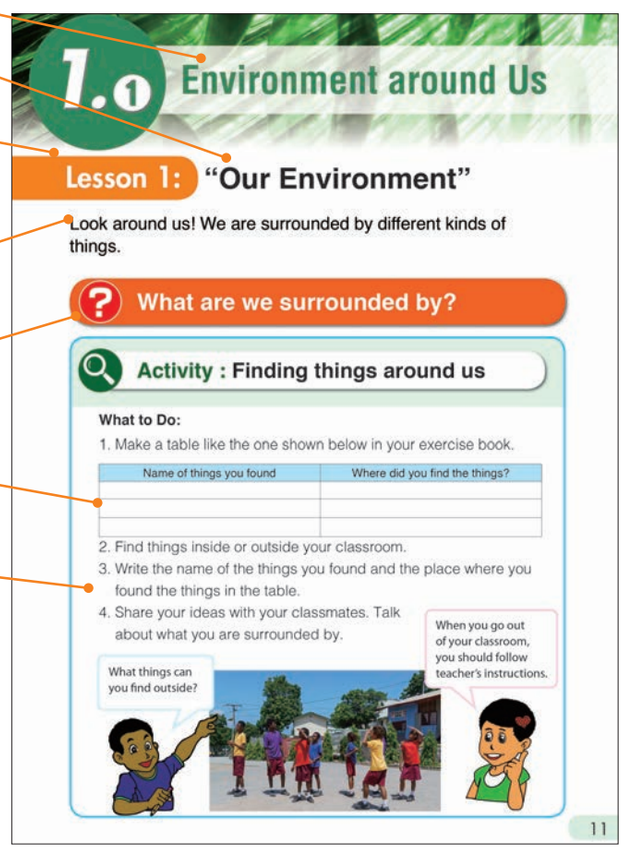
Firstly, the composition of the textbook is introduced, then, the components in this teacher's manual are introduced in the following section.

1.1 Composition of Science textbook

The Science textbook is designed like this to have its components to repeatedly appear in each chapter, as shown in the top-right box ('structure in a chapter'). Each component is shown in the right.

The teacher's manual is designed according to the structure of the textbook in order to help the teacher to easily refer to the teacher's manual for preparation and implementation of a lesson.

Lesson

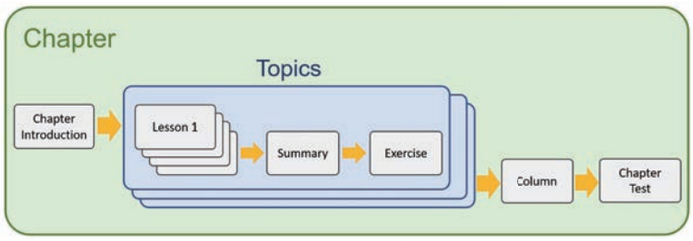


Chapter Introduction

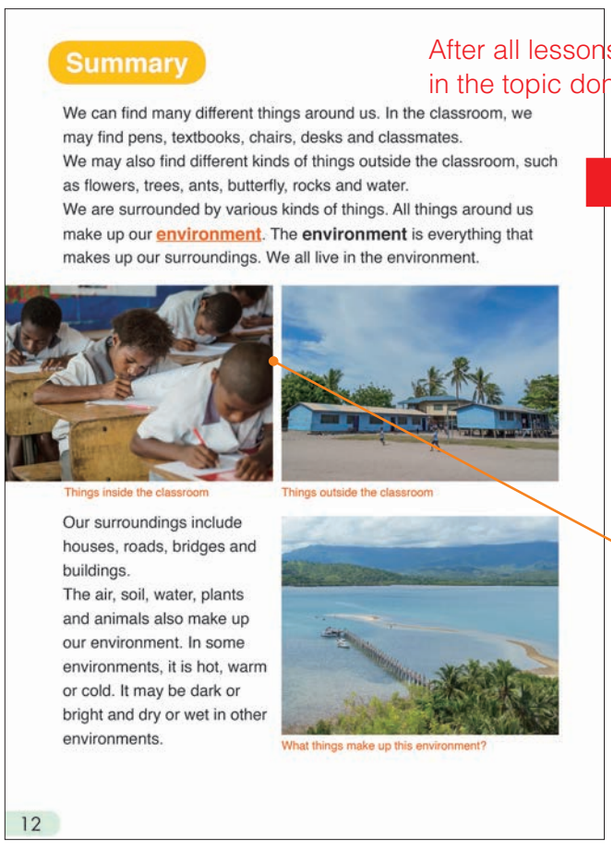
Structure in a chapter

Science textbook consists of several chapters based on learning contents according to the syllabus. All chapters have regular components as shown in the diagram below.

1. Chapter Introduction
2. Main content pages
3. Summary
4. Exercise
5. Column
6. Chapter test



(main content page) **Summary** **Exercise**


Summary

We can find many different things around us. In the classroom, we may find pens, textbooks, chairs, desks and classmates.
We may also find different kinds of things outside the classroom, such as flowers, trees, ants, butterfly, rocks and water.
We are surrounded by various kinds of things. All things around us make up our environment. The **environment** is everything that makes up our surroundings. We all live in the environment.

Things inside the classroom

Things outside the classroom

Our surroundings include houses, roads, bridges and buildings.
The air, soil, water, plants and animals also make up our environment. In some environments, it is hot, warm or cold. It may be dark or bright and dry or wet in other environments.

What things make up this environment?

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After all lessons in the topic done...


Summary 1.1 Environment around Us

Our Environment

Natural Things

Man-made Things

Things in the Environment

Living Things

Non-living Things

Living Things and Non-living Things

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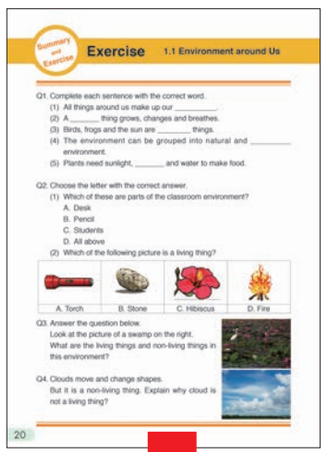
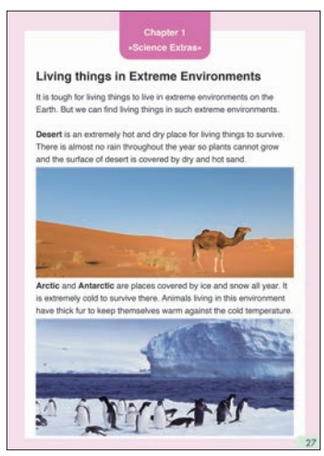
Summary of the lesson


Exercise 1.1 Environment around Us

20

Column


Chapter 1
•Science Extras•

Living things in Extreme Environments

It is tough for living things to live in extreme environments on the Earth. But we can find living things in such extreme environments.

Desert is an extremely hot and dry place for living things to survive. There is almost no rain throughout the year so plants cannot grow and the surface of desert is covered by dry and hot sand.

Arctic and **Antarctic** are places covered by ice and snow all year. It is extremely cold to survive there. Animals living in this environment have thick fur to keep themselves warm against the cold temperature.

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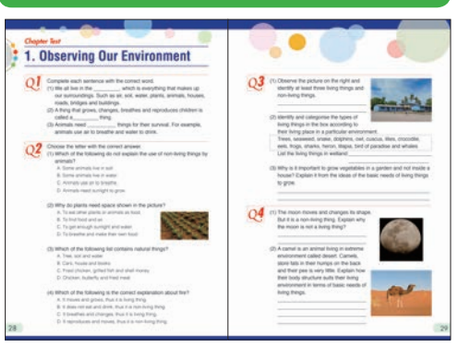
After all topics done...

Chapter test


Chapter Test

1. Observing Our Environment

28

29

Go to next Chapter...

1.2 Main contents page in Teacher's Manual

The main content page in this Teacher's manual has 8 components, Basic lesson information, Lesson objectives, Assessment, Preparation, Lesson flow, Teacher's note, Sample Blackboard Plan and a reduced textbook page.

Basic lesson information

Basic information such as name of the unit, chapter and topic in which the lesson is involved is shown. In addition, numbering (numerical code) and total number of lessons in the chapter are also shown to make teaching schedule easier.

Textbook page of the lesson

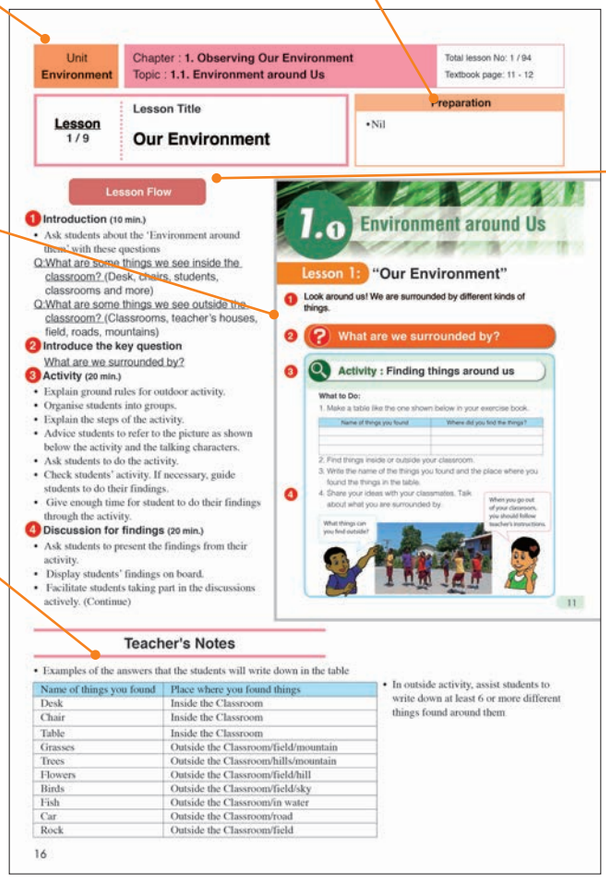
Corresponding textbook page number is shown at the center. The numbers in red circle on the page correspond to the 'Lesson Flow' to show where the content is in the lesson flow.

Teacher's Notes

Supplementary information that would be useful for teaching, such as background knowledge and more detailed explanation, is introduced.
In case of materials or equipment not accessible nationwide, the alternatives are mentioned and instructions on how to improvise are provided.

Preparation

Materials and apparatuses recommended for use in the lesson are shown.



The lesson flow should be followed in line with the concept of textbook;

1 Introduction

In the introduction, normally teacher makes students review the previous lesson to connect the new lesson through the key question. An example of the introduction is shown in the lesson flow.

2 Showing a key question

The key question is closely related to the core or main points of the lesson including the new knowledge, new concepts and new skills. The teacher delivers the key question by using the review of the previous lesson or a new phenomena at the beginning of a new lesson. In this particular lesson, students try to answer the key question by guessing or predicting based on their experiences.

3 Activity

The activity is delivered to examine their guess and prediction to the key question. In some lessons, the teacher may deliver the activity without students' prediction or hypothesis. These two different ways are dependent on the lesson content. Activities are carried out by a group, individually or done by teacher's demonstration, which is dependent on the availability of the materials and contexts of the lesson topics. Teacher allows students to have enough time to do the activity.

Lesson Flow

A lesson flow includes several teaching points. The main components are:
❶. Introduction, ❷. Key question, ❸. Activity, ❹. Discussion and ❺. Summary.
Lesson flow in some lessons contains additional information like "Result" or "Challenge", according to the content of the lesson in the textbook.

Lesson Objectives

Objectives Objectives capturing the main knowledge and skills in the lesson are provided in the textbook.

Assessment

Teacher should reflect own lesson along this criteria through the lesson. The three components of knowledge, thinking skills, attitude & values are also indicated in the teacher's manual.

'Knowledge' means new concepts, new findings and their relationships.

'Thinking skills' means scientific process skills, which contain observing, measuring, inferring, classifying, predicting and communicating.

'Attitude and Value' means the interests, curiosities and respect for nature and recognition on the importance and usefulness of the content.

Refer to Teachers Guide for detail information.

Sample Blackboard Plan

A sample of blackboard of lesson notes writing is introduced. Contents of the blackboard sample are equivalent to the main teaching points of the lesson and can be utilised as a guide. In the sample blackboard plan, examples of the results in the activity and expected student's answers are written in coloured words.

❹ Discussion

In the discussion part, the teacher allows students to present their results or findings from the activity and to share with all other students. The teacher allows time to students to think and seek the answers for the key question by using the results or findings in the activity. The teacher must verify the results to the students to avoid misconceptions. In the case, for Grade 3, some of the results in the activity would be same as the conclusion of the lesson.

❺ Summary

The summary confirms the core points of the lesson. The teacher asks questions shown in the teacher's manuals as summative assessment to students in order to confirm if they have acquired the main knowledge and skills in the lesson. The summary points may be the students' findings or results in the discussion part of the textbook which the teacher would facilitate and direct students.

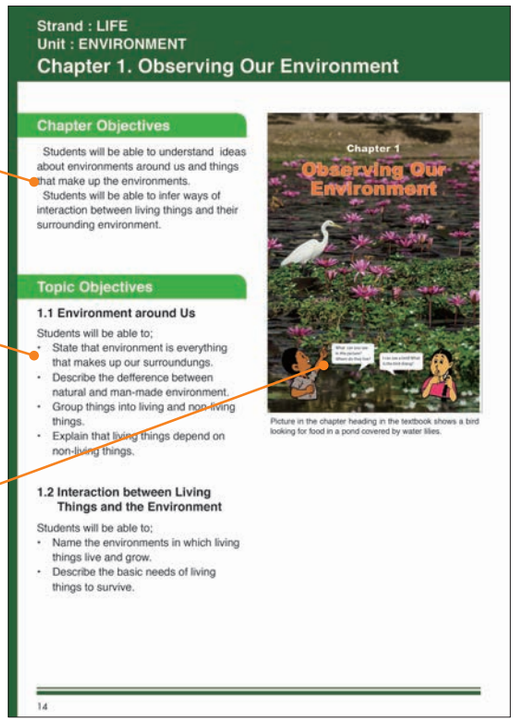
1.3 Chapter Introduction in Teacher's Manual

In the beginning of a chapter, the necessary information for the chapter such as chapter and topic objectives, linkages of the learning contents with other chapters and grades and a list of lessons are introduced. Student's prior knowledge learned in previous lesson or grade or experiences through their daily life are also provided.

Chapter Objectives
The objectives to achieve the chapter are introduced.

Topic Objectives
The objectives to achieve each topic are introduced.

Chapter heading
A picture of nature in Papua New Guinea or things in daily life related to the learning contents in the chapter is introduced with the list of lesson titles at each chapter heading in textbook.


Strand : LIFE
Unit : ENVIRONMENT
Chapter 1. Observing Our Environment

Chapter Objectives

Students will be able to understand ideas about environments around us and things that make up the environments.
Students will be able to infer ways of interaction between living things and their surrounding environment.

Topic Objectives

1.1 Environment around Us

Students will be able to;
- State that environment is everything that makes up our surroundungs.
- Describe the defference between natural and man-made environment.
- Group things into living and non-living things.
- Explain that living things depend on non-living things.

1.2 Interaction between Living Things and the Environment

Students will be able to;
- Name the environments in which living things live and grow.
- Describe the basic needs of living things to survive.

Chapter 1
Observing Our Environment

Picture in the chapter heading in the textbook shows a bird looking for food in a pond covered by water lilies.

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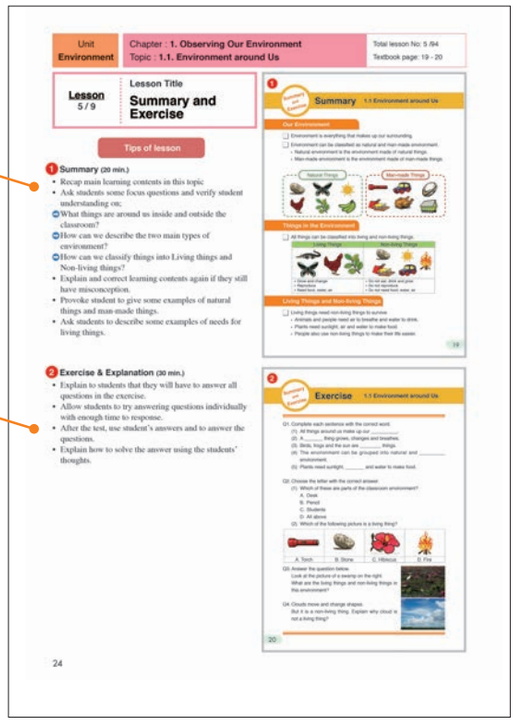
1.4 Summary and Exercise / Science Extras in Teacher's Manual

Summary and Exercise are inserted at the end of each topic, and column is inserted at the end of each chapter.

Summary in the Topic
The summary in the topic are shown with supplementary information.

Exercise of the Topic
Questions as student's exercise for learning contents in each topic are shown. To know students understanding, allow all students enough time to try solving the questions. After that, teacher must give the answer to students and teach how to solve each question.


Unit: Environment
Chapter : 1. Observing Our Environment
Topic : 1.1. Environment around Us
Total lesson No: 5 /94
Textbook page: 19 - 20

Lesson 5 / 9
Lesson Title: Summary and Exercise

Tips of lesson

1 Summary (20 min.)
- Recap main learning contents in this topic
- Ask students some focus questions and verify student understanding on;
  - What things are around us inside and outside the classroom?
  - How can we describe the two main types of environment?
  - How can we classify things into Living things and Non-living things?
- Explain and correct learning contents again if they still have misconception.
- Provoke student to give some examples of natural things and man-made things.
- Ask students to describe some examples of needs for living things.

2 Exercise & Explanation (30 min.)
- Explain to students that they will have to answer all questions in the exercise.
- Allow students to try answering questions individually with enough time to response.
- After the test, true student's answers and to answer the questions.
- Explain how to solve the answer using the students' thoughts.

Summary 1.1 Environment around Us

Exercise 1.1 Environment around Us

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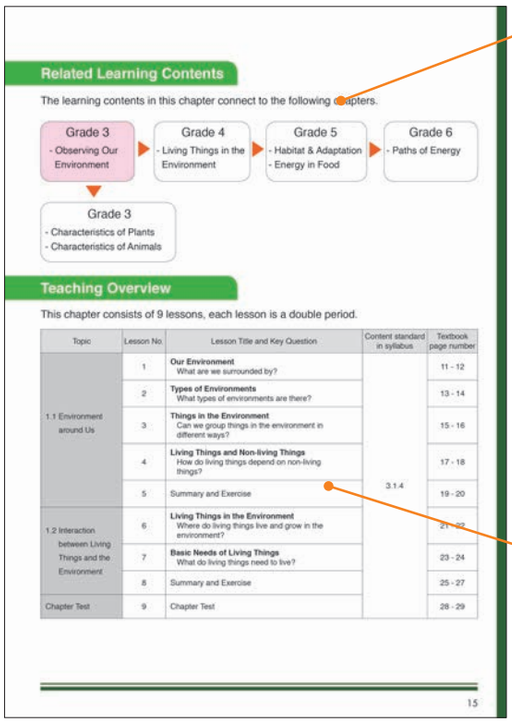

Related Learning Contents

The learning contents in this chapter connect to the following chapters.

Grade 3
- Observing Our Environment

Grade 4
- Living Things in the Environment

Grade 5
- Habitat & Adaptation
- Energy in Food

Grade 6
- Paths of Energy

Grade 3
- Characteristics of Plants
- Characteristics of Animals

Teaching Overview

This chapter consists of 9 lessons, each lesson is a double period.

Topic	Lesson No.	Lesson Title and Key Question	Content standard in syllabus	Textbook page number
1.1 Environment around Us	1	**Our Environment** What are we surrounded by?	3.1.4	11 - 12
	2	**Types of Environments** What types of environments are there?		13 - 14
	3	**Things in the Environment** Can we group things in the environment in different ways?		15 - 16
	4	**Living Things and Non-living Things** How do living things depend on non-living things?		17 - 18
	5	Summary and Exercise		19 - 20
1.2 Interaction between Living Things and the Environment	6	**Living Things in the Environment** Where do living things live and grow in the environment?		21 - 22
	7	**Basic Needs of Living Things** What do living things need to live?		23 - 24
	8	Summary and Exercise		25 - 27
Chapter Test	9	Chapter Test		28 - 29

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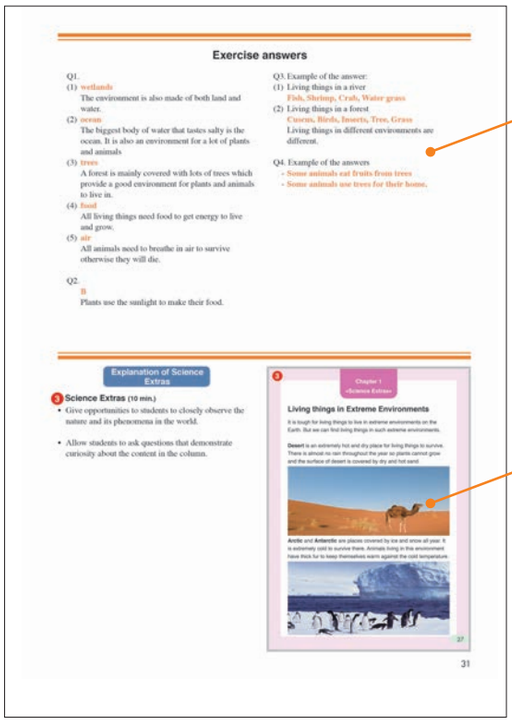
Related Learning Contents

In the Syllabus, key learning contents are scoped and sequenced across all grades, from elementary to grade 12. The linkage of main learning contents of a chapter links to that in other chapters including other Grades from Grade 3 to Grade 6 are outlined as a concept map. Content in a chapter of a grade is necessary to be taught which links the contents to be learned in the same grade or the next grade. The concept map will help the teachers to visualise such a scope and sequence to teach in the classroom.

Teaching Overview

Topic, lesson titles and key questions, lesson number in the chapter, textbook page number and numerical code of related content standards written in the syllabus are introduced



Exercise answers

Q1.
(1) wetlands
The environment is also made of both land and water.
(2) ocean
The biggest body of water that tastes salty is the ocean. It is also an environment for a lot of plants and animals
(3) trees
A forest is mainly covered with lots of trees which provide a good environment for plants and animals to live in.
(4) food
All living things need food to get energy to live and grow.
(5) air
All animals need to breathe in air to survive otherwise they will die.

Q2.
B
Plants use the sunlight to make their food.

Q3. Example of the answer:
(1) Living things in a river
Fish, Shrimp, Crab, Water grass
(2) Living things in a forest
Cucuru, Birds, Insects, Tree, Grass
Living things in different environments are different.

Q4. Example of the answers
- Some animals eat fruits from trees
- Some animals use trees for their home.

Explanation of Science Extras

3 Science Extras (10 min.)
- Give opportunities to students to closely observe the nature and its phenomena in the world.
- Allow students to ask questions that demonstrate curiosity about the content in the column.

Chapter 1 -Science Extras-

Living things in Extreme Environments

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Answer of Exercise question

Answers of the questions in exercise are provided.

Science Extras (Column)

In column page, interesting information related to the chapter contents are introduced as 'Science Extras' to make students really interested in science.
Students are given time to read the column and discuss about the content with classmates.

2. How to deliver a Science lesson

Both the Textbook and the Teacher's Manual work hand in hand to deliver a meaningful and successful lesson. However, there are a few important things to consider before lessons are taught to avoid misconceptions. Teacher should consider:

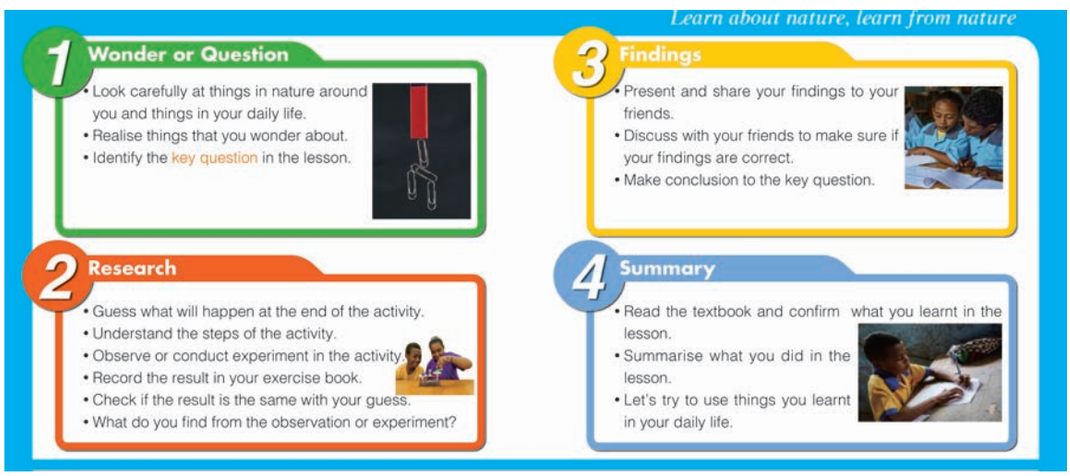
1. Having a Textbook and Teacher Manual on hand.
2. Knowing what was the previous and the next day's lesson contents before delivering the current lesson.
3. Preparing teaching materials prior to the lesson.
4. Reading the Lesson Objectives and understanding it very well.
5. Reading and understanding the Teacher's notes to have some background content knowledge of the lesson before teaching.
6. Following the sequence of the lesson carefully and consult the sample blackboard plan to confirm the lesson flow and notes.
7. Studying carefully the sample blackboard plan.

3. What to consider while presenting the lesson

Teacher should always consider the points mentioned above to help present the lesson effectively to the students. Everything that the teacher needs to know prior to the lesson is clearly written in the Teacher's Manual. The teacher would only have the manual while delivering the lesson because the reduced size of the textbook is inserted in the manual to help guide and follow with the class.

At the beginning of each lesson, all lessons have a key question that students are asked to think about ways on how to find out. Teachers will also realise that it encourages Problem Solving approach (Page 8-9) through the lesson. Teachers must be mindful that student's presentation of their findings is very rare and special. While doing problem solving, some findings presented may result in some misconceptions. However, when such arises consider those opinions or findings and always direct their attention back to the main focus of the lesson to flow with everyone in the class so that they learn and understand.

In several lessons, basic science instruments such as a thermometer, compass and simple electric circuit are required. For Grades 3 and 4 students, teachers must assist them to master how to use the instruments to develop their manipulative skills.



Concept of problem solving approach in the layout of students textbook (page 8 and 9)

4. What to do during Lesson Preparation

1. Annual Overview (Page 12-13)
The Yearly overview for Grade 3 Science lessons provides the links to the syllabus. The annual overview shows strand, unit, chapter, topics and lesson titles. The time allocation for each lesson in Science is recognised as a double period for 60 minutes (30 minutes x 2 lessons).

2. Read Teacher's manual
Necessary information for teaching is introduced in the Teacher's Manual. Teacher will read and understand the components of the teacher's manual as follows; lesson objectives, assessments, preparation, lesson flow, teacher's notes and sample blackboard.

3. Test the activity
Before the lesson, a teacher has to prepare the necessary materials and equipment written in teacher's manual. In addition, it is essential for teachers to do a trial of the activity involving on experiment before the lesson. Conditions such as temperature, humidity, materials and equipment used in the lesson may vary. If you are able to find that the result obtained differs or is incorrect, then you should be aware of how to adjust the ways of presenting the activity.The success of the lesson depends entirely on how well a teacher prepares and facilitates students learning to be concrete and effective.

4. Prepare blackboard plan
After understanding the lesson contents, teacher prepares the black board plans shown in the Teacher's Manual. The effective use of blackboard is important for student-friendly lessons because students can easily take notes.

5. How to use blackboard

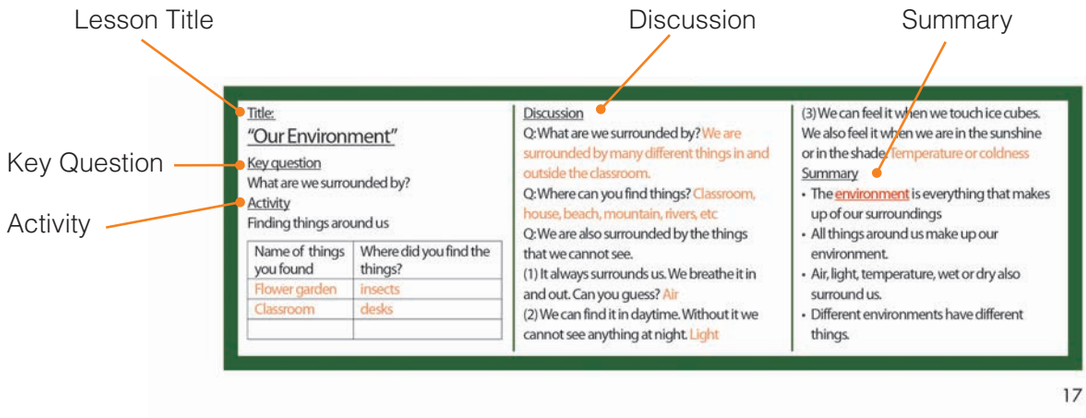
The common practice for the teachers utilising the blackboard is dividing it into sections for each subject. The Blackboard is an important teaching tool for teachers when utilised well. Therefore, in this Teacher's Manual it introduces the strategy for enhancing the effectiveness of blackboards for improving student learning.

1. To start a lesson, utilise the blackboard from the top left-hand corner of the blackboard to the right, top to the bottom chronologically as done in the Sample Blackboard Plan. The utilisation of the blackboard will accommodate the components of the blackboard plan below.

2. Encourage students to come out to the board to display their ideas and findings by writing and explaining what they have.

3. Allow students sufficient time to copy what you wrote before you erase it.

Sample Blackboard Plan



6. Yearly Overview

Yearly overview is designed purposely for the systematic flow of the grade content. It is helpful in the preparation of the yearly program to effectively plan for teaching strategies. The strands, 'Life', 'Physical Science' and 'Earth and Space' are core strands of science in the syllabus.

STRAND	UNIT	Chapter	Topic	Term	No	LESSON in Chap.	Lesson Contents	Page Number
LIFE	Environment	1. Observing Our Environment	1.1 Environment around Us	Term 1	1	1	Our Environment	16
					2	2	Types of Environments	18
					3	3	Things in the Environment	20
					4	4	Living Things and Non-living Things	22
					5	5	Summary and Exercise	24
			1.2 Interaction between Living Things and the Environment		6	6	Living Things in the Environment	26
					7	7	Basic Needs of Living Things	28
					8	8	Summary and Exercise	30
					9	9	Chapter Test	32
PHYSICAL SCIENCE	MATTER	2. Properties of Matter	2.1 Describing Matter		10	1	Matters around Us	36
					11	2	Properties of Matter	38
					12	3	Heavy or Light?	40
					13	4	Big or Small?	42
					14	5	Float or Sink?	44
					15	6	What Matter Do We Use?	46
					16	7	Summary and Exercise	48
			2.2 Measuring Matter		17	8	Taking Up Space	50
					18	9	Measuring Volume of Water	52
					19	10	Measuring Volume of Stone	54
					20	11	Weight and Shape of Matter	56
					21	12	Weight and Volume of Matter	58
					22	13	Summary and Exercise	60
			2.3 Mixing Matter		23	14	Observing a Mixture	62
					24	15	Separating a Mixture	64
					25	16	Summary and Exercise	66
					26	17	Chapter Test	68
LIFE	PLANTS	3. Characteristics of Plants	3.1 Observing Plants	Term 2	27	1	Plants around us	72
					28	2	Observing Plant Parts	74
					29	3	Function of Plant Parts	76
					30	4	Summary and Exercise	78
			3.2 Grouping Plants		31	5	How to Group Plants: Roots	80
					32	6	How to Group Plants: Stems	82
					33	7	How to Group Plants: Leaves	84
					34	8	Summary and Exercise	86
					35	9	Chapter Test	88
LIFE	ANIMALS	4. Characteristics of Animals	4.1 Observing Animals		36	1	Animal Groups	92
					37	2	Observing Insects	94
					38	3	Observing Fish	96
					39	4	Observing Amphibians	98
					40	5	Observing Reptiles	100
					41	6	Observing Birds	102
					42	7	Observing Mammals	104
					43	8	Animal Body Parts and Their Uses	106
					44	9	Summary and Exercise	108
					45	10	Chapter Test	110
PHYSICAL SCIENCE	ENERGY	5. Energy	5.1 Energy around Us		46	1	Energy	114
					47	2	Uses of Energy	116
					48	3	Summary and Exercise	118
					49	4	Chapter Test	120

Chapters are arranged in sequential order from the first to the last. Each chapter contains one or more topics. The lesson number in the chapter is given to each lesson according to the students' textbook. Each lesson is recommended to be conducted as double periods (60 minutes). Finally, the page numbers are attached to each lesson to easily identify the lesson topics for planning and teaching.

STRAND	UNIT	Chapter	Topic	Term	No	LESSON in Chap.	Lesson Contents	Page Number
EARTH AND SPACE	SPACE	6. The Sun	6.1 Properties of the Sun		50	1	The Sun in the Sky	124
					51	2	Sunny Place and Shady Place	126
					52	3	Summary and Exercise	128
			6.2 Movement of the Sun		53	4	Sun and Shadow	130
					54	5	Movement of the Sun:	132
					55	6	Day and Night	134
					56	7	Summary and Exercise	136
					57	8	Chapter Test	138
PHYSICAL SCIENCE	ENERGY	7. Light	7.1 Properties of Light		58	1	What Makes Us See Objects?	142
					59	2	How Does Light Travel?	144
					60	3	Light Passing Through Objects	146
					61	4	Formation of Shadow	148
				Term 3	62	5	Shape and Size of Shadow	150
					63	6	Light Reflection	152
					64	7	Gathering Light	154
					65	8	Summary and Exercise	156
					66	9	Chapter Test	158
PHYSICAL SCIENCE	ENERGY	8. Magnet	8.1 Properties of Magnet		67	1	Magnet around Us	162
					68	2	What is Attracted to a Magnet?	164
					69	3	Force of Attraction between Magnet and Object	166
					70	4	Properties of Poles of Magnets	168
					71	5	Making a Magnet	170
					72	6	Which way?	172
					73	7	Summary and Exercise	174
					74	8	Chapter Test	176
PHYSICAL SCIENCE	FORCE AND MOTION	9. Force	9.1 Objects in Motion		75	1	How Objects Move	180
					76	2	Push and Pull	182
					77	3	Slower and Stop	184
					78	4	Speed Up and Slow Down	186
					79	5	The Way Objects Move	188
					80	6	More about Forces	190
					81	7	Summary and Exercise	192
			9.2 Simple Machine		82	8	What is a Simple Machine?	194
					83	9	Inclined Plane	196
				Term 4	84	10	Lever	198
					85	11	Pulley	200
					86	12	Summary and Exercise	202
					87	13	Chapter Test	204
EARTH AND SPACE	OUR EARTH	10. The Earth	10.1 Surface of the Earth		88	1	Covering the Earth	208
					89	2	Rocks	210
					90	3	Soil around Us	212
					91	4	Properties of Soil	214
					92	5	Importance of Soil for Plants and Animals	216
					93	6	Summary and Exercise	218
					94	7	Chapter Test	220

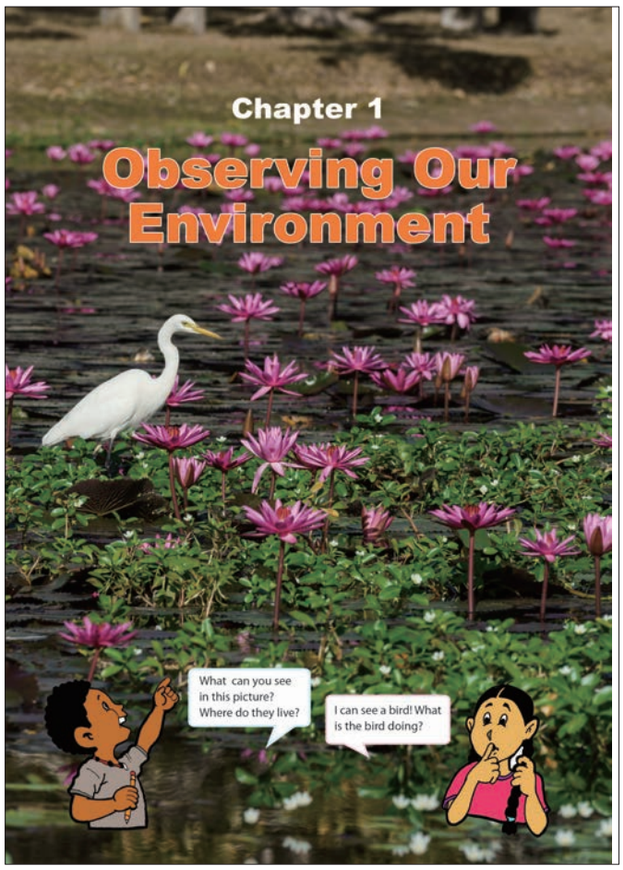
Strand : LIFE
Unit : ENVIRONMENT

Chapter 1. Observing Our Environment

Chapter Objectives

Students will be able to understand ideas about environments around us and things that make up the environments.

Students will be able to infer ways of interaction between living things and their surrounding environment.



Picture in the chapter heading in the textbook shows a bird looking for food in a pond covered by water lilies.

Topic Objectives

1.1 Environment around Us

Students will be able to;

- State that environment is everything that makes up our surroundings.
- Describe the difference between natural and man-made environment.
- Group things into living and non-living things.
- Explain that living things depend on non-living things.

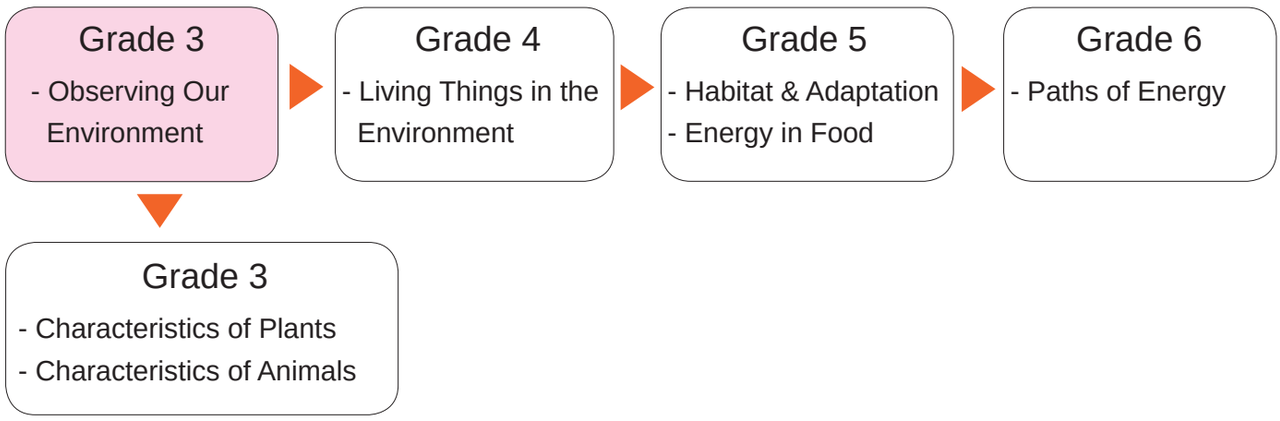
1.2 Interaction between Living Things and the Environment

Students will be able to;

- Name the environments in which living things live and grow.
- Describe the basic needs of living things to survive.

Related Learning Contents

The learning contents in this chapter connect to the following chapters.



Teaching Overview

This chapter consists of 9 lessons, each lesson is a double period.

Topic	Lesson No.	Lesson Title and Key Question	Content standard in syllabus	Textbook page number
1.1 Environment around Us	1	**Our Environment** What are we surrounded by?	3.1.4	11 - 12
	2	**Types of Environments** What types of environments are there?		13 - 14
	3	**Things in the Environment** Can we group things in the environment in different ways?		15 - 16
	4	**Living Things and Non-living Things** How do living things depend on non-living things?		17 - 18
	5	Summary and Exercise		19 - 20
1.2 Interaction between Living Things and the Environment	6	**Living Things in the Environment** Where do living things live and grow in the environment?		21 - 22
	7	**Basic Needs of Living Things** What do living things need to live?		23 - 24
	8	Summary and Exercise		25 - 27
Chapter Test	9	Chapter Test		28 - 29

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 1 / 94
Environment	Topic : **1.1. Environment around Us**	Textbook page: 11 - 12

Lesson 1 / 9

Lesson Title

Our Environment

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Ask students about the 'Environment around them' with these questions

Q:What are some things we see inside the classroom? (Desk, chairs, students, classrooms and more)

Q:What are some things we see outside the classroom? (Classrooms, teacher's houses, field, roads, mountains)

2 Introduce the key question

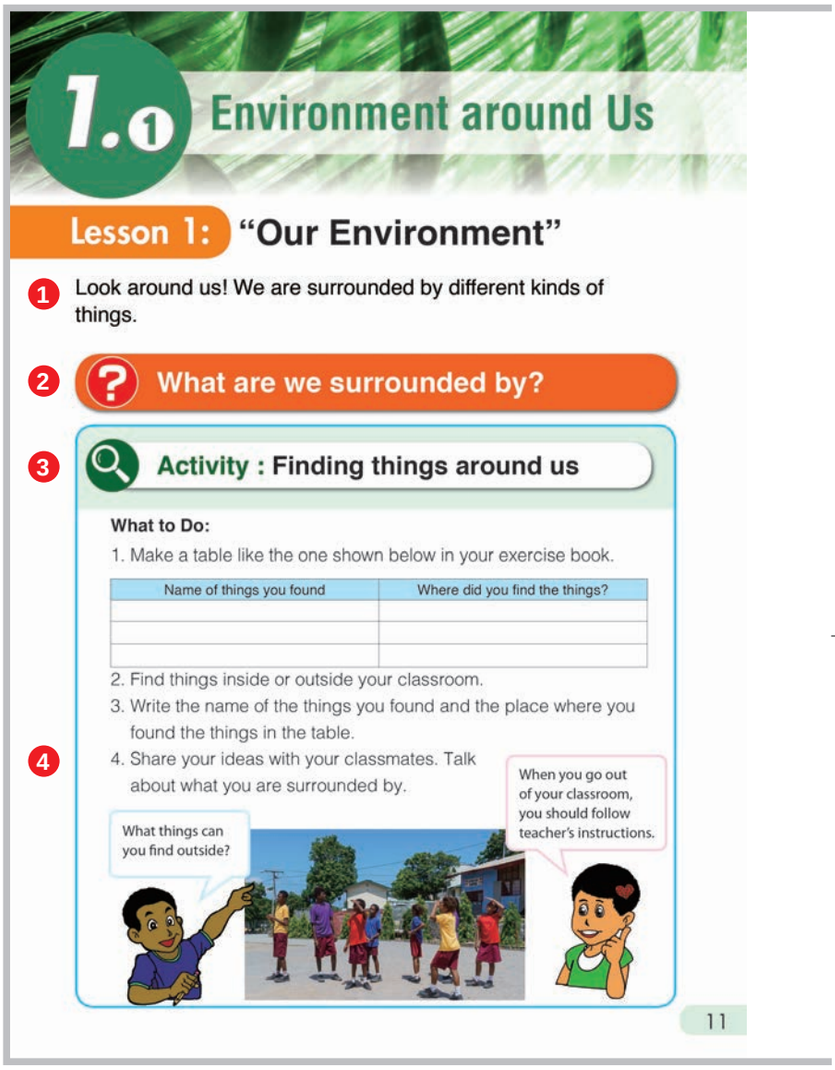
What are we surrounded by?

3 Activity (20 min.)

- Explain ground rules for outdoor activity.
- Organise students into groups.
- Explain the steps of the activity.
- Advice students to refer to the picture as shown below the activity and the talking characters.
- Ask students to do the activity.
- Check students' activity. If necessary, guide students to do their findings.
- Give enough time for student to do their findings through the activity.

4 Discussion for findings (20 min.)

- Ask students to present the findings from their activity.
- Display students' findings on the board.
- Facilitate students taking part in the discussions actively. (Continue)



Teacher's Notes

- Examples of the answers that the students will write down in the table.

Name of things you found	Place where you found things
Desk	Inside the Classroom
Chair	Inside the Classroom
Table	Inside the Classroom
Grasses	Outside the Classroom/field/mountain
Trees	Outside the Classroom/hills/mountain
Flowers	Outside the Classroom/field/hill
Birds	Outside the Classroom/field/sky
Fish	Outside the Classroom/in water
Car	Outside the Classroom/road
Rock	Outside the Classroom/field

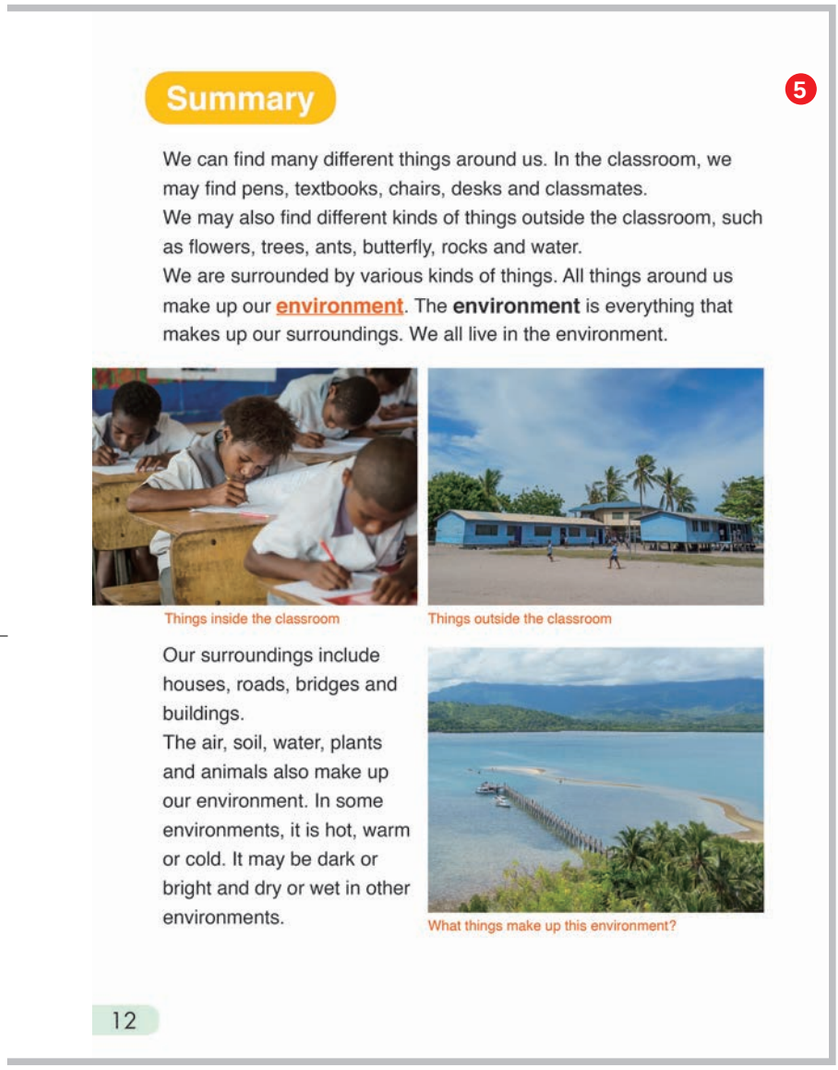
- In outside activity, assist students to write down at least 6 or more different things found around them.

Lesson Objectives

Students will be able to:
- Define the environment.
- Identify different things in the environment.

Assessment

Students are able to:
- Explain what an environment is.
- Describe the different things in the environment.
- Listen to their classmates responses with respect.



Summary

5

We can find many different things around us. In the classroom, we may find pens, textbooks, chairs, desks and classmates.
We may also find different kinds of things outside the classroom, such as flowers, trees, ants, butterfly, rocks and water.
We are surrounded by various kinds of things. All things around us make up our **environment**. The **environment** is everything that makes up our surroundings. We all live in the environment.

Things inside the classroom

Things outside the classroom

Our surroundings include houses, roads, bridges and buildings.
The air, soil, water, plants and animals also make up our environment. In some environments, it is hot, warm or cold. It may be dark or bright and dry or wet in other environments.

What things make up this environment?

12

- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:What are we surrounded by?(We are surrounded by many different things in and outside the classroom.)

Q:Where can you find things? (Classroom, house, beach, mountain, rivers, etc)

- Ask the following questions to encourage students to realise that air, light and temperature also surround us:

Q:We are also surrounded by the things that we cannot see.

(1) It always surrounds us. We breathe it in and out. Can you guess? (Air)

(2) We can find it in daytime. Without it we cannot see anything at night.(Light)

(3) We can feel it when we touch ice cubes and when we are in the sunshine or in the shade. (Temperature or coldness/hotness)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson. (Refer to Blackboard)
- Ask the following questions:
  Q: What is the meaning of environment?
  Q: What are we surrounded by?
  Q: What are we surrounded by in a house, on the beach and on mountain?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Our Environment"

Key question
What are we surrounded by?

Activity
Finding things around us

Name of things you found	Where did you find the things?
insects	Flower garden
desks	Classroom

Discussion

Q: What are we surrounded by? We are surrounded by many different things in and outside the classroom.

Q: Where can you find things? Classroom, house, beach, mountain, rivers, etc

Q: We are also surrounded by the things that we cannot see.

(1) It always surrounds us. We breathe it in and out. Can you guess? Air

(2) We can find it in daytime. Without it we cannot see anything at night. Light

(3) We can feel it when we touch ice cubes. We also feel it when we are in the sunshine or in the shade. Temperature or coldness

Summary
- The environment is everything that makes up of our surroundings
- All things around us make up our environment.
- Air, light, temperature, wet or dry also surround us.
- Different environments have different things.

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 2 / 94
Environment	Topic : **1.1. Environment around Us**	Textbook page: 13 - 14

Lesson 2 / 9

Lesson Title

Types of Environments

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Review the last lesson:

Q:What is an environment?

Q:What are examples of some things found in the environment?

- Encourage students to think about the different types of environment by asking questions.

Q:Are there any different types of environment around us?

2 Introduce the key question

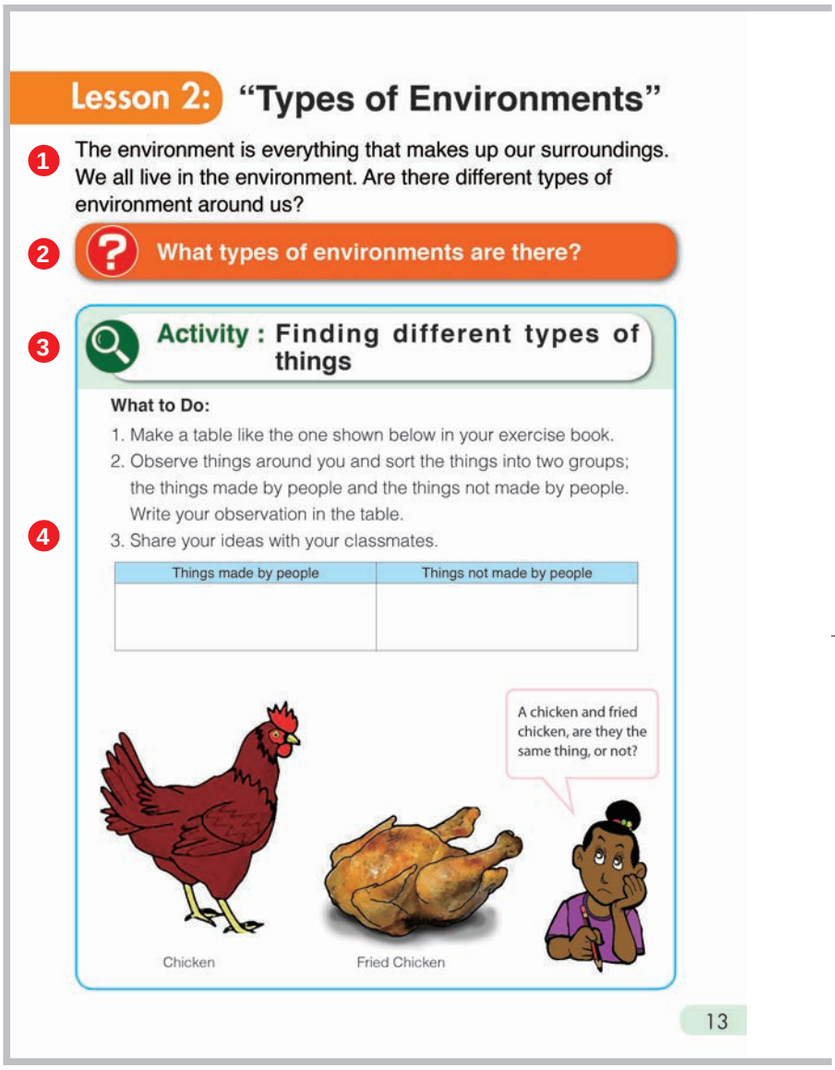
What types of environments are there?

3 Activity (20 min.)

- Organise students in pairs or some groups.
- Explain the steps for the activity.
- Advise students to refer to the two pictures and characters' talking in the activity for their investigation.
- Ask students to do the activity.
- Check students' activity. If necessary guide students to do their findings.
- Give enough time to students to find their answers and fill their tables.

4 Discussion for findings (20 min.)

- Ask students to present the findings from their activity
- Display students table of results on board. (Continue)



Lesson 2: "Types of Environments"

1 The environment is everything that makes up our surroundings. We all live in the environment. Are there different types of environment around us?

2 What types of environments are there?

3 Activity : Finding different types of things

What to Do:

1. Make a table like the one shown below in your exercise book.
2. Observe things around you and sort the things into two groups; the things made by people and the things not made by people. Write your observation in the table.
3. Share your ideas with your classmates.

4

Things made by people	Things not made by people

13

Teacher's Notes

- Examples of answers the students may write or give in the table.

Things made by people	Things not made by people
Table	Trees
Desk	Grasses
Chair	Flowers
Classroom	Clouds
Books	Sun

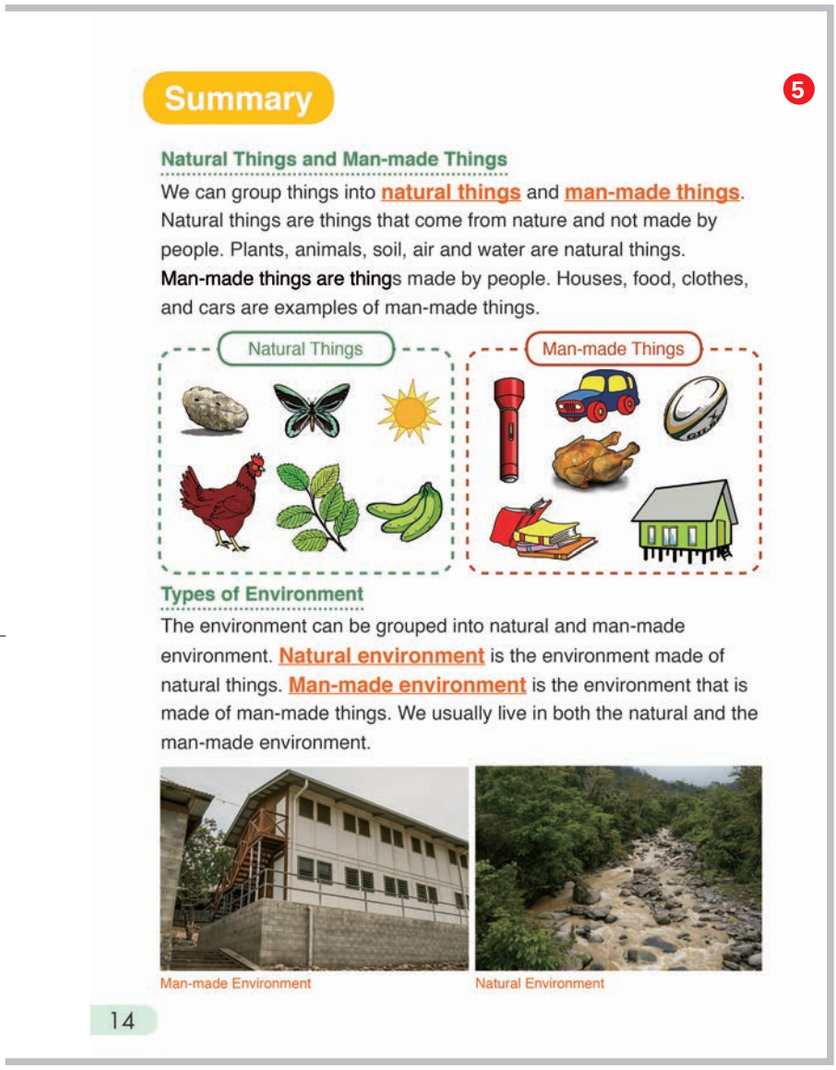
- Some students will struggle to draw a table so the teacher has to identify them and assist them by demonstrating the steps involved over again.
- Students should a least record 6 things under each headings of the table.

Lesson Objectives

Students will be able to:
- Identify two main types of environment.
- Classify things into natural and man-made things.

Assessment

Students are able to:
- Describe how two types of environment are different.
- List examples of natural things and man-made things.
- Listen to the opinions from others with respect.



Summary

5

Natural Things and Man-made Things

We can group things into **natural things** and **man-made things**. Natural things are things that come from nature and not made by people. Plants, animals, soil, air and water are natural things. **Man-made things are things** made by people. Houses, food, clothes, and cars are examples of man-made things.

Types of Environment

The environment can be grouped into natural and man-made environment. **Natural environment** is the environment made of natural things. **Man-made environment** is the environment that is made of man-made things. We usually live in both the natural and the man-made environment.

Man-made Environment

Natural Environment

14

- Facilitate students taking part in the discussion actively.
- Confirm the 'things made by people and things not made by people' with students.
- **Based on their findings,** ask the following questions.

Q: Why do you think chicken that is cooked is human made? (Because people cooked it)

Q: What about the living chicken? Why is it a thing from nature? (Because people did not make it alive (life)

Q: How can we group things? (The things made by people and the things not made by people.

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson.(refer to Blackboard sample)
- Ask the following questions in order to check students' understanding (Assessment).
  Q: How can we group things into two groups?
  Q: Give some examples of natural and man-made things.
  Q: What is natural environment?
  Q: What is man-made environment
  Q: In which environment do we live?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title: "Types of Environments"

Key question
What types of environments are there?

Activity
Finding different types of things.

Things made by people	Things not made by people
Table	Trees
Desk	Grass
Chair	Flowers
Classroom	Clouds
Books	Sun

Discussion

Q: Why do you think chicken that is cooked is human made?
Because people cooked it.

Q: What about the living chicken? Why is it a thing from nature?
Because people did not make it alive (life)

Q: How can we group the things?
The things made by people and the things not made by people.

Summary

- The things around us can be grouped: Natural things and Man-made things
  - Natural things are things that come from nature and not made by people. e.g. trees and animals etc.
  - Man-made things are things made by man. e.g. buildings and trucks etc.
- The environment can be grouped into: Natural and Man-made environment
  - Natural environment is the environment made of natural things.
  - Man-made environment is the environment made of man-made things.
- People live in both environments.

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 3 / 94
Environment	Topic : **1.1. Environment around Us**	Textbook page: 15 - 16

Lesson 3 / 9

Lesson Title

Things in the Environment

Preparation

- Flower pot with a growing plant

Lesson Flow

1 Introduction (10 min.)

- Revise the last lesson on 'natural and man-made environment.'

Q:What are the two main types of environment?
(Natural and man-made)

- Show students a plant growing in a pot and ask this question;

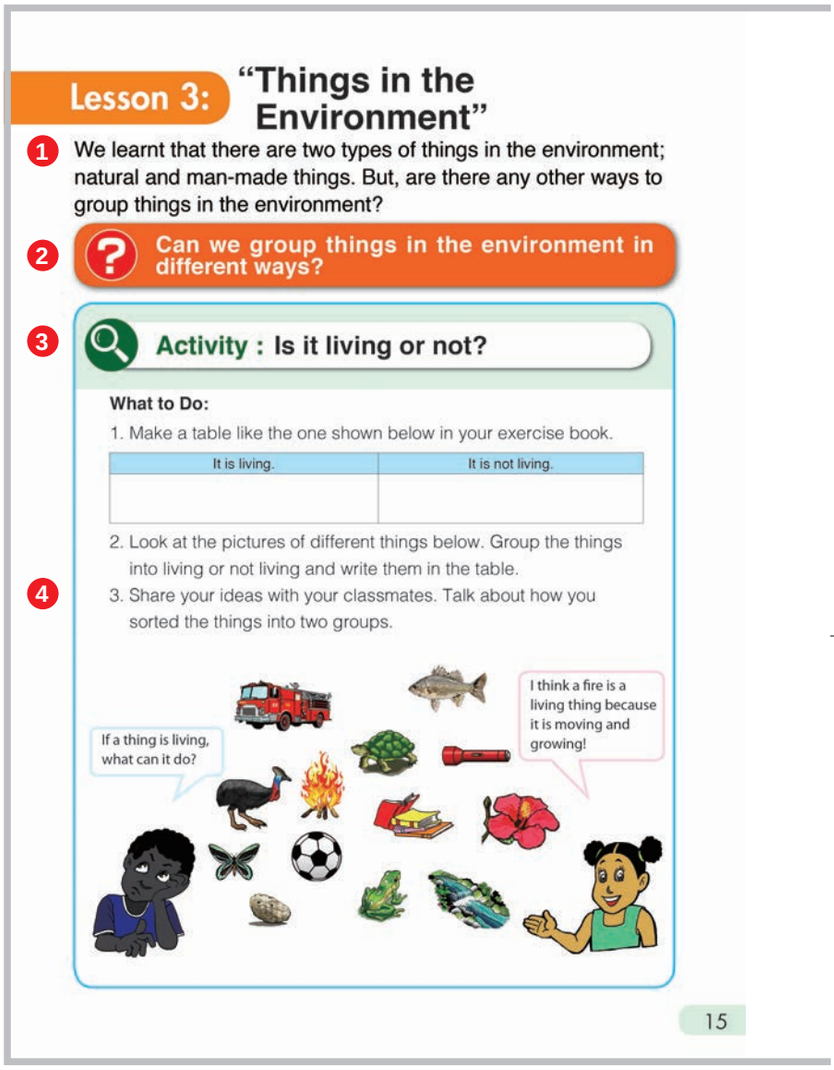
Q:What makes the plant and the pot different?
(Plant has leaves and pot doesn't, plant is green and pot isn't, plant grows and pot doesn't)

2 Introduce the key question

Can we group things in the environment in different ways?

3 Activity (20 min.)

- Explain ground rules for outside activity.
- Organise students into groups.
- Explain the steps of the activity.
- Ask students to study the pictures below the activity and take note of the talking characters.
- Ask the students to do the activity.
- Check students' activity. If necessary guide students to do their findings.
- Give enough time for the students to do their findings.



Lesson 3: "Things in the Environment"

1 We learnt that there are two types of things in the environment; natural and man-made things. But, are there any other ways to group things in the environment?

2 Can we group things in the environment in different ways?

3 Activity : Is it living or not?

What to Do:

1. Make a table like the one shown below in your exercise book.

It is living.	It is not living.

2. Look at the pictures of different things below. Group the things into living or not living and write them in the table.
3. Share your ideas with your classmates. Talk about how you sorted the things into two groups.

4

15

Teacher's Notes

Characteristics of Living things

All living things have these seven characteristics.

- **Growth** - change of size and shape. e.g. baby to an adult.
- **Movement** - type of movement [fast, slow]
- **Breathe** - gas exchange [Breathing and exhaling air]
- **Feeding** - where it gets its food and what it eats.
- **Excretion** - giving out waste e.g. urine, excrete, oxygen from plants.
- **Reproduction**- how and when it reproduce
- **Respond** to stimuli- how sensitive is it to the environment e.g. touching, smelling, tasting and sunlight for plants.

Lesson Objectives

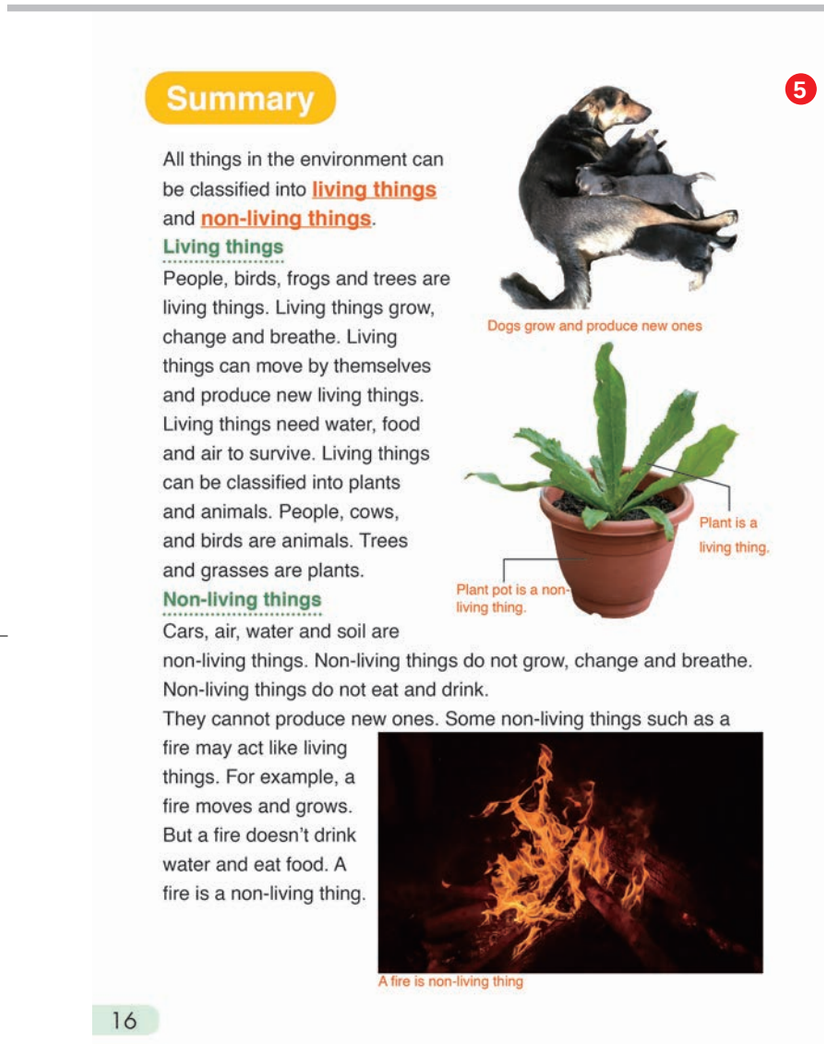
Students will be able to:

- Classify things as living things and non-living things according to their characters.
- Explain the characters of living things and non-living things in the environment.

Assessment

Students are able to:

- List things in the environment as living and non-living things
- Describe the characters of living things and non-living things in the environment
- Respect and assist each other to classify things.



Summary

All things in the environment can be classified into **living things** and **non-living things**.

Living things

People, birds, frogs and trees are living things. Living things grow, change and breathe. Living things can move by themselves and produce new living things. Living things need water, food and air to survive. Living things can be classified into plants and animals. People, cows, and birds are animals. Trees and grasses are plants.

Dogs grow and produce new ones

Plant is a living thing.

Plant pot is a non-living thing.

Non-living things

Cars, air, water and soil are non-living things. Non-living things do not grow, change and breathe. Non-living things do not eat and drink. They cannot produce new ones. Some non-living things such as a fire may act like living things. For example, a fire moves and grows. But a fire doesn't drink water and eat food. A fire is a non-living thing.

A fire is non-living thing

16

5

4 Discussion for findings (20 min.)

- Ask students to present the findings from their activity.
- Display students table of results on board.
- Facilitate students taking part actively in the discussion.
- Confirm the things that are 'living and non-living'.

Q:How can we group things? (Things that live and things that do not live.)

Q:How are they different? (Living things grow, move, breathe, produce new ones and need food and air. Non-living things don't live, move, eat, and grow, etc)

Q:Wind, flame, cars and water in a river are moving. Are they living things or not? Why do you think so? (They are non-living things. They do not eat, grow, breath, change or produce new ones like living things do.)

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson.(refer to Blackboard sample)
- Ask the following questions in order to check students' understanding (Assessment):
  - Q:How can we group things into living things and non-living things?
  - Q:What are some examples of characters of living things?
  - Q:What are some examples of living things and non-living things?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"Things in the Environment"

Key question

Can we group things in the environment in different ways?

Activity Is it living or not?

It is living	It is not living
Fish	Car
Bird	Fire
Butterfly	Books

Discussion

Q: How can we group things?

Things that live and things that not live.

Q: How are they different?

Living things grow, move, breathe, produce new ones and need for food, air. Things don't live don't move, eat, and grow, etc

Q: Wind, flame, cars and water in a river are moving. Are they living things or not? Why do you think so?

They are non-living things. They do not eat, grow, breath, change or produce new ones like living things do.

Summary

- All things can be grouped into living thing and non- living thing.
- Living things can grow, move on their own, breathe and can produce new ones. e.g. people, birds, trees, grasses, etc.
- Living things can be plants and animals.
- Non-living things do not grow, change, breathe, do not eat and reproduce new ones. e.g. car, air, water, soil, fire, etc

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 4 / 94
Environment	Topic : **1.1. Environment around Us**	Textbook page: 17 - 18

Lesson 4 / 9

Lesson Title

Living Things and Non-living Things

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Review the last lesson.

Q:How can we group things?

Q:How are living and non-living things different?

- Motivate students to think about the different ways to classify things by asking;

Q:What are the relationships between living and non-living things in the environment?

2 Introduce the key question

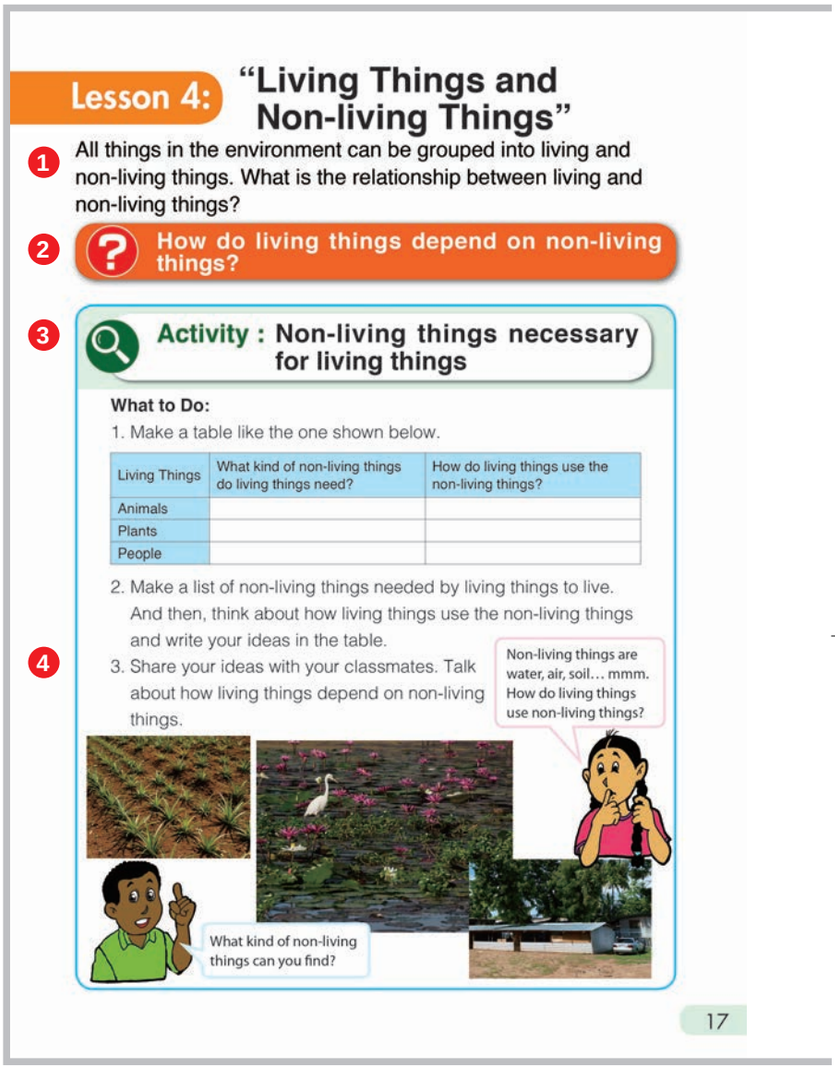
How do living things depend on non-living things?

3 Activity (20 min.)

- Organise the students into groups.
- Explain the steps of activity.
- Advice students to study the pictures below the activity and the talking characters.
- Ask students to do the activity.
- Check students' activity and if necessary guide them to do their findings.
- Give enough time for student to find new ideas through activity.

4 Discussion for findings (20 min.)

- Ask students to present the findings from their activity. (Continue)



Lesson 4: "Living Things and Non-living Things"

1 All things in the environment can be grouped into living and non-living things. What is the relationship between living and non-living things?

2 How do living things depend on non-living things?

3 Activity : Non-living things necessary for living things

What to Do:

1. Make a table like the one shown below.

Living Things	What kind of non-living things do living things need?	How do living things use the non-living things?
Animals		
Plants		
People		

2. Make a list of non-living things needed by living things to live. And then, think about how living things use the non-living things and write your ideas in the table.
3. Share your ideas with your classmates. Talk about how living things depend on non-living things.

4

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Teacher's Notes

- Examples of answer from the students

Types of Living Things	Non-living Things that Living Things depend on
Animals	Air to breathe, water to drink, place to live, hiding place (protection)
Plants	Sunlight, air, water, use soil as space to grow
People	Air to breathe, water to drink, use soil for growing food and making pottery, and technology to make life better

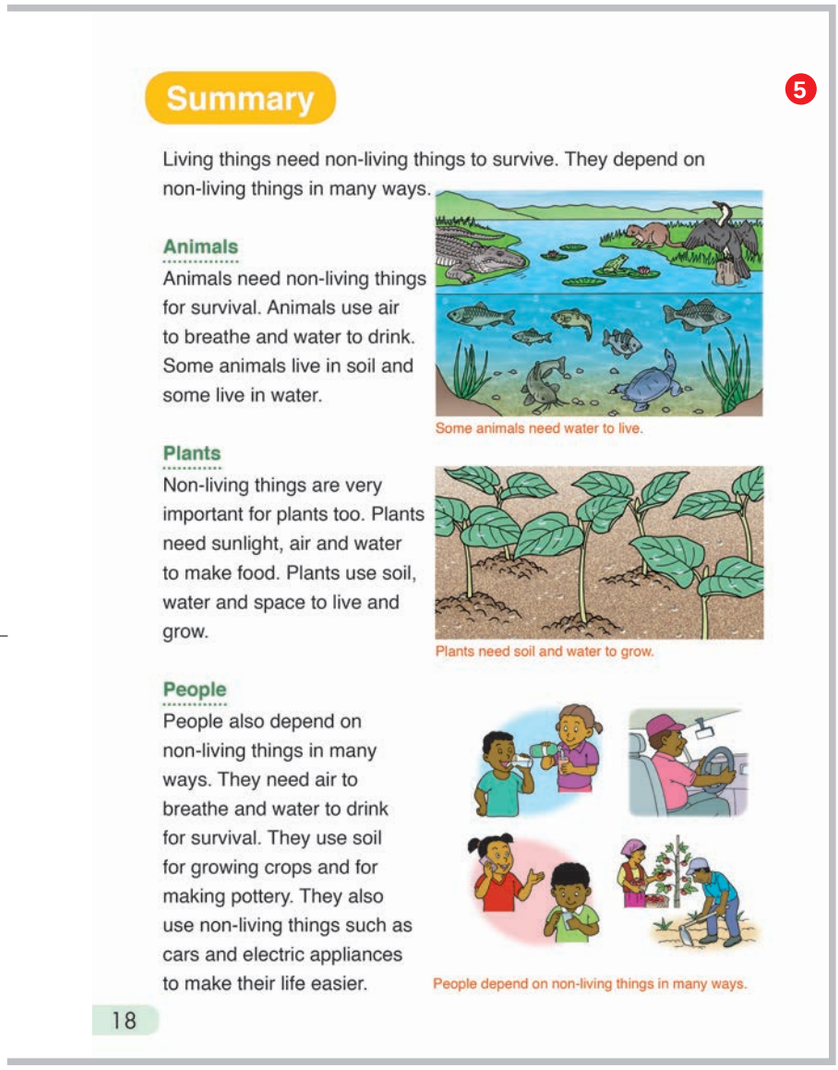
- Some animals eat plants to survive, but most animals get oxygen to breathe to be alive from plants.
- Plants also depend on the animals for carbon dioxide to make own food
- A spider hides under a rock, plants take in nutrients from the soil, and people breathe in air to be alive

Lesson Objectives

Students will be able to:
- Explain how living things depend on non-living things.
- Infer the ways that living things use the non-living things.

Assessment

Students are able to:
- List the ways in which living things depend on the non-living thing.
- Describe the reason why living things depend on non-living things.
- Listen to others' responses with respect.



Summary

Living things need non-living things to survive. They depend on non-living things in many ways.

Animals

Animals need non-living things for survival. Animals use air to breathe and water to drink. Some animals live in soil and some live in water.

Some animals need water to live.

Plants

Non-living things are very important for plants too. Plants need sunlight, air and water to make food. Plants use soil, water and space to live and grow.

Plants need soil and water to grow.

People

People also depend on non-living things in many ways. They need air to breathe and water to drink for survival. They use soil for growing crops and for making pottery. They also use non-living things such as cars and electric appliances to make their life easier.

People depend on non-living things in many ways.

18

- Write down their findings on blackboard.
- Facilitate students taking part in the discussions actively.
- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:How do animals depend on non-living things? (For air to breathe, water to drink, soil to live in etc.)

Q:How do plants depend on non-living things? (For sunlight, air and water to make food, soil for growing etc.)

Q:How do people depend on non-living things? (For air to breathe, food to eat and water to drink, soil for agriculture, cars to move and carry etc.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson.(refer to Blackboard)
- People depend on air to breathe, water to drink, and use soil for growing food and making pottery
- Ask the following questions as assessment:

Q: How do plants depend on non-living things?

Q: How do animals depend on the non-living things?

Q: How do people depend on the non-living things?

Q: Why do living things depend on non-living things?

- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title: "Living things and Non-living things"

Key question

How do living things depend on non-living things?

Activity

Non-living things necessary for living things

Living things	What kinds of non-livings do living things need?	How do the living things use the non-living things?
Refer to Teacher's Note		

Discussion

Q: How do animals depend on non-living things?

Air to breathe, water to drink, soil to live, etc

Q: How do plants depend on non-living things?

Sunlight, air and water for making food, soil for growing, etc

Q: How do people depend on non-living things?

Air to breathe, food to eat and water to drink, soil for agriculture, cars to move and carry, etc

Summary

- Living things depend on non-living things to survive.
- Animals depend on air to breathe, water to drink, and soil to live in.
- Plants depend on sunlight, air and water to make food, and use soil as space to grow.
- People depend on air to breathe, water to drink, and use soil for growing food.
- People also use cars to move or carry and houses to live.

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 5 /94
Environment	Topic : **1.1. Environment around Us**	Textbook page: 19 - 20

Lesson
5 / 9

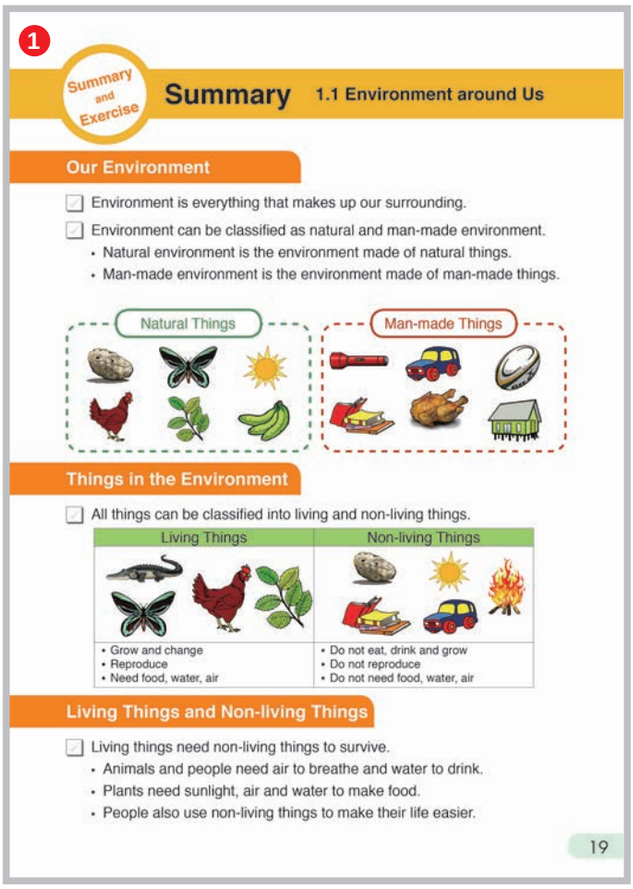
Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (20 min.)

- Recap main learning contents in this topic
- Ask students some focus questions and verify student understanding on;
  - What things are around us inside and outside the classroom?
  - How can we describe the two main types of environment?
  - How can we classify things into Living things and Non-living things?
- Explain and correct learning contents again if they still have misconception.
- Provoke student to give some examples of natural things and man-made things.
- Ask students to describe some examples of needs for living things.



1

Summary and Exercise

Summary 1.1 Environment around Us

Our Environment

- Environment is everything that makes up our surrounding.
- Environment can be classified as natural and man-made environment.
  - Natural environment is the environment made of natural things.
  - Man-made environment is the environment made of man-made things.

Natural Things | Man-made Things

Things in the Environment

- All things can be classified into living and non-living things.

Living Things	Non-living Things
• Grow and change • Reproduce • Need food, water, air	• Do not eat, drink and grow • Do not reproduce • Do not need food, water, air

Living Things and Non-living Things

- Living things need non-living things to survive.
  - Animals and people need air to breathe and water to drink.
  - Plants need sunlight, air and water to make food.
  - People also use non-living things to make their life easier.

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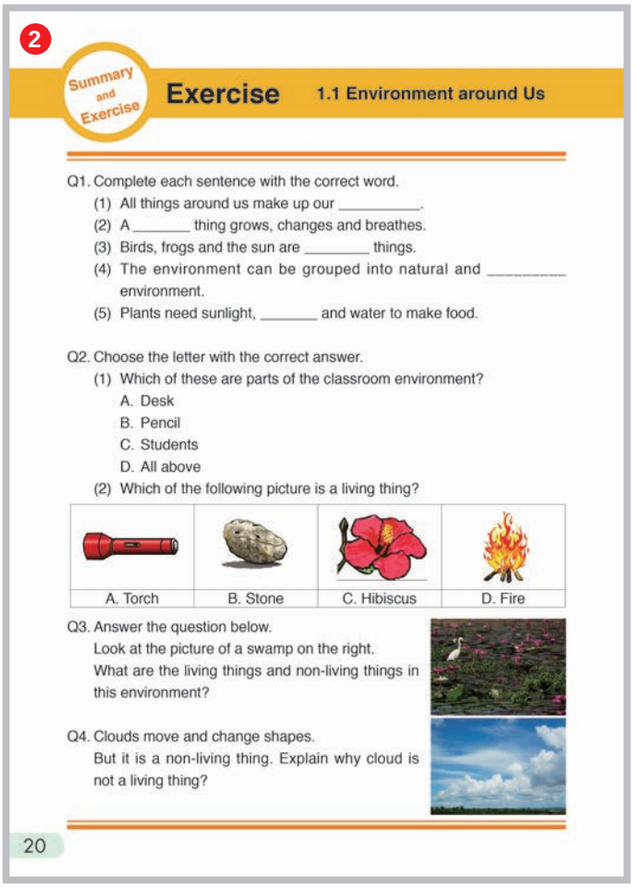
2 Exercise & Explanation (30 min.)

- Explain to students that they will have to answer all questions in the exercise.
- Allow students to try answering questions individually with enough time to respond.
- After the test, use student's answers to answer the questions.
- Explain how to solve the answer using the students' thoughts.



2

Summary and Exercise

Exercise 1.1 Environment around Us

Q1. Complete each sentence with the correct word.
(1) All things around us make up our _____.
(2) A _____ thing grows, changes and breathes.
(3) Birds, frogs and the sun are _____ things.
(4) The environment can be grouped into natural and _____ environment.
(5) Plants need sunlight, _____ and water to make food.

Q2. Choose the letter with the correct answer.
(1) Which of these are parts of the classroom environment?
A. Desk
B. Pencil
C. Students
D. All above
(2) Which of the following picture is a living thing?

A. Torch | B. Stone | C. Hibiscus | D. Fire

Q3. Answer the question below.
Look at the picture of a swamp on the right.
What are the living things and non-living things in this environment?

Q4. Clouds move and change shapes.
But it is a non-living thing. Explain why cloud is not a living thing?

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Exercise answers

Q1.

(1) **environment**
Where we are and everything around us are our environment.

(2) **living**

(3) **natural**
The sun isn't a living thing but a natural thing.

(4) **man-made**

(5) **air**
Plants depends on non-living things to make their food.

Q2.

(1) **D**
All things in an environment are parts of the environment.

(2) **C**
Hibiscus is a plant and plants are living things.

Q3. Example of the answer:

- Living things
  birds, water lilies
- Non-living things
  Water, air

This is a swamp environment that are made up of both living and non-living things.

Q4. Example of the answers

A cloud is a non-living thing because it does not need food or water and does not reproduce its children.

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 6 / 94
Environment	Topic : **1.2. Interaction between Living Things and the Environment**	Textbook page: 21 - 22

Lesson 6 / 9

Lesson Title

Living Things in the Environment

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Review the Lesson 1: 'Our Environment' and Lesson 3: 'Things in the Environment' in Topic 1.1:

Q:What is environment?

Q:How can we group living things?

- Motivate students to think about the place where living things live by asking;

Q:Where can we find plants and animals in the environment?

2 Introduce the key question

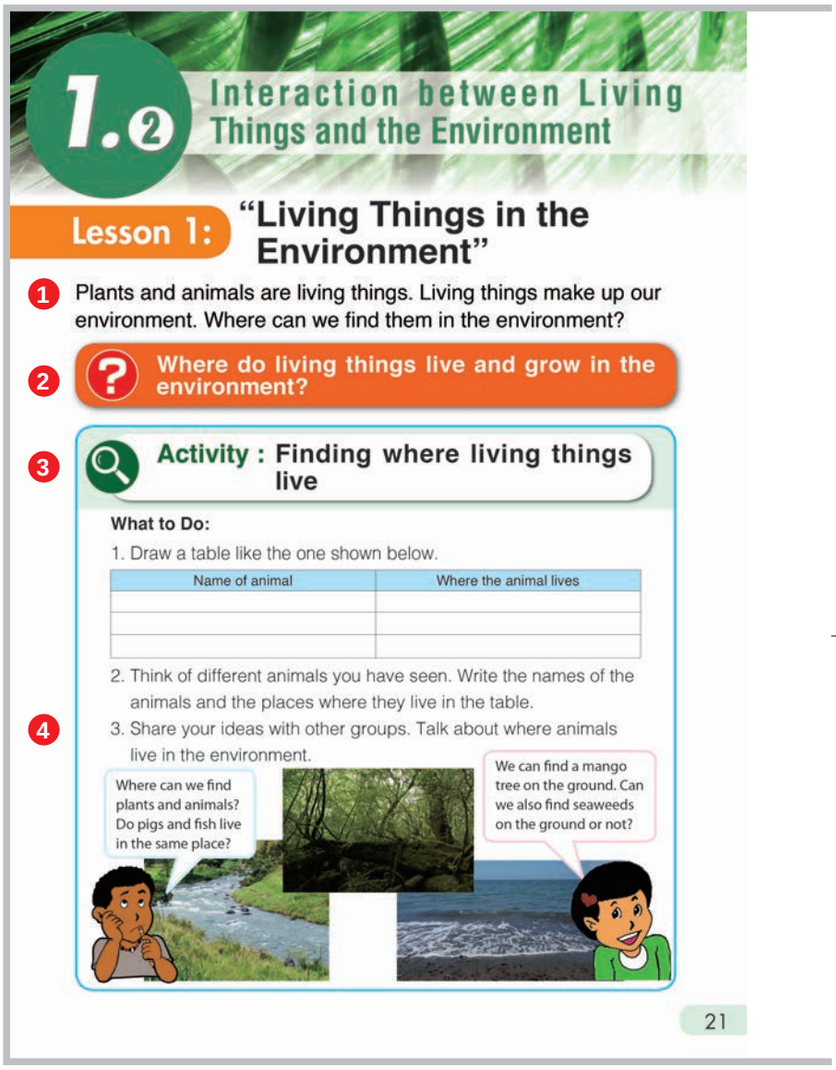
Where do living things live and grow in the environment?

3 Activity (20 min.)

- Organise students in groups.
- Explain the steps of the activity.
- Ask students to refer to the pictures below the activity and the talking characters.
- Ask the students to do the activity.
- Check students' activity. If necessary, guide students to do their findings.
- Give enough time for the students to come up with their results.

4 Discussion for findings (20 min.)

- Ask students to present the findings from the activity.
- Write down their findings on the board. (Continue)



Teacher's Notes

- Examples of answers that students would write down in their table. Please note that this activity asks students to find real animals around the classroom. Thus, the table allow students to list animals which students actually find. For instance, 'Lion' in the table cannot be found in PNG, it is obviously strange.
- Bird and fish are not the name of animals (They are 'classes' of animals). Ask students to identify the name of animals such as 'eagle' and 'eel'. But if the students cannot name the animal, they can just write how the it look like (e.g. small insects). Memorising the names of the animals is NOT the focus of this lesson.
- Once students identify the places animals grow, let them think about other animals in different environment. Students should at least record 3-5 different animals from different places.

Names of Animals	Place where you found the animals
Grasshopper	In the grassland
Bird	On the tree branches
Fish	In the river/sea
Gecko	On the classroom walls

Bird and fish are not the name.

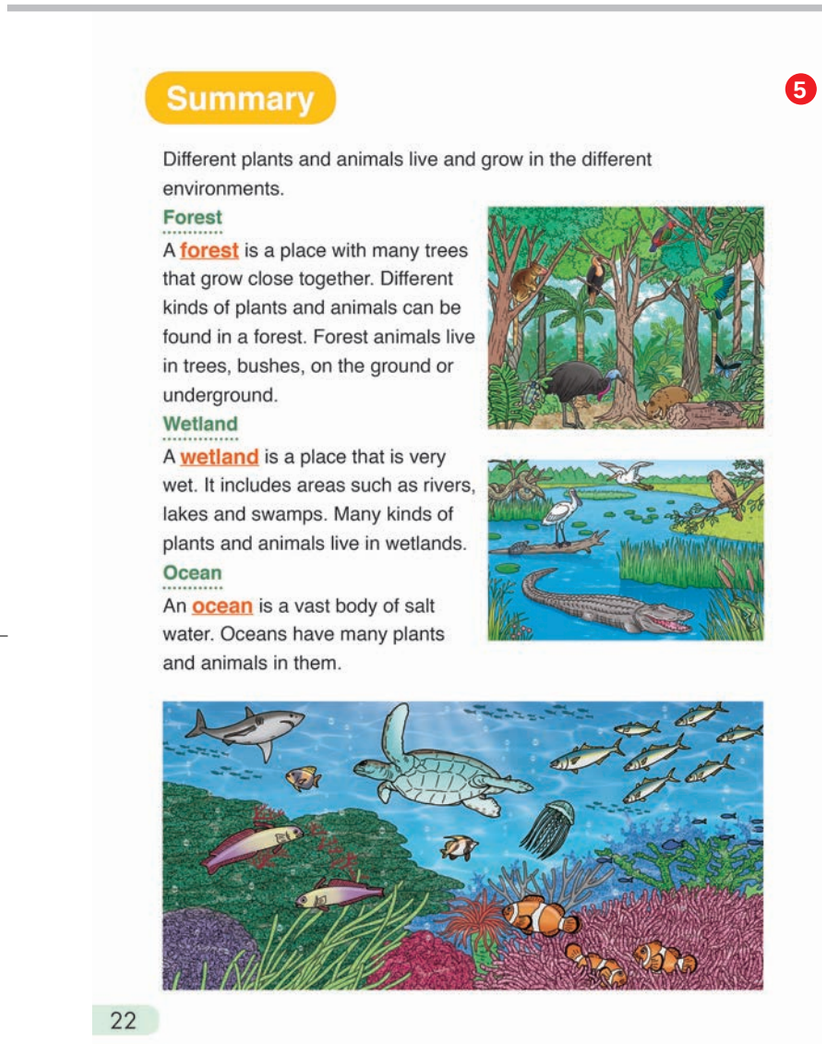
"river/sea" is too general, try to specify with the place they live.

Lesson Objectives

Students will be able to:
- Identify the different types of plants and animals in the different environments.
- Define forests, wetlands and oceans.

Assessment

Students are able to:
- List the different kinds of living things and the places where they live.
- Explain what a forest, wetland and ocean is.
- Take part in the activity with interest.



Summary

Different plants and animals live and grow in the different environments.

Forest

A forest is a place with many trees that grow close together. Different kinds of plants and animals can be found in a forest. Forest animals live in trees, bushes, on the ground or underground.

Wetland

A wetland is a place that is very wet. It includes areas such as rivers, lakes and swamps. Many kinds of plants and animals live in wetlands.

Ocean

An ocean is a vast body of salt water. Oceans have many plants and animals in them.

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- Facilitate students taking part in the discussions actively.
- Confirm the findings with students.
- Explain what a forest, wetland and ocean is.
- Ask students to classify living things into three groups: living things that live in a forest, wetland and ocean.
- **Based on the students finding,** ask the following questions.

Q:What kinds of animals live in the forest? (Snake, bird of paradise, owl, cuscus etc.)

Q:What kinds of animals live in rivers, lakes and swamps? (Crocodile, eels, frogs, heron, tilapia etc.)

Q:What kinds of living things live in ocean? (Octopus, lobster, shark, dolphin, whale, star fish, etc)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson.(refer to Blackboard sample)
- Ask the following questions as assessment:
  Q: What is a forest, wetland and ocean?
  Q: Give some examples of living things that live in a forest, wetland and ocean.
  Q: Where can we find the different kinds of living things?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Animals in the Environment"

Key question
Where do living things live and grow in the environment?

Activity
Finding where living things live

Name of Animals	Place where you find the animals
Tilapia	In the river next our school
Cuscus	On the tree in forest
Sea turtle	Ocean

Discussion

Q: What kinds of living things live in the forest? Trees, Snake, bird of paradise, owl, cuscus, etc

Q: What kinds of living things live in rivers, lakes and swamps? Trees, lilies, crocodile, eels, frogs, heron, tilapia, etc

Q: What kinds of living things live in ocean? Octopus, lobster, shark, dolphin, whale, star fish, etc

Q: Where can we find the different kinds of living things? The different kinds of living things can be found in the different places.

Summary
- Different living things live and grow in the different environment.
- Forest environment
  It is a place with many trees that grow close together.
- Wetland environment
  It is a place that is very wet such as rivers, lakes, and swamp.
- Ocean environment
  It is the vast body of salt water.

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 7 / 94
Environment	Topic : **1.2. Interaction between Living Things and the Environment**	Textbook page: 23 - 24

Lesson 7 / 9

Lesson Title

Basic Needs of Living Things

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Review the previous lesson.

Q:What are the environments where animals live in?

Q:What are examples of plants that grow in the forests, wetlands and oceans?

- Encourage students to think about the basic needs of living things by asking;

Q:What do we need to survive and grow?

Q:From where do living things get their needs?

2 Introduce the key question

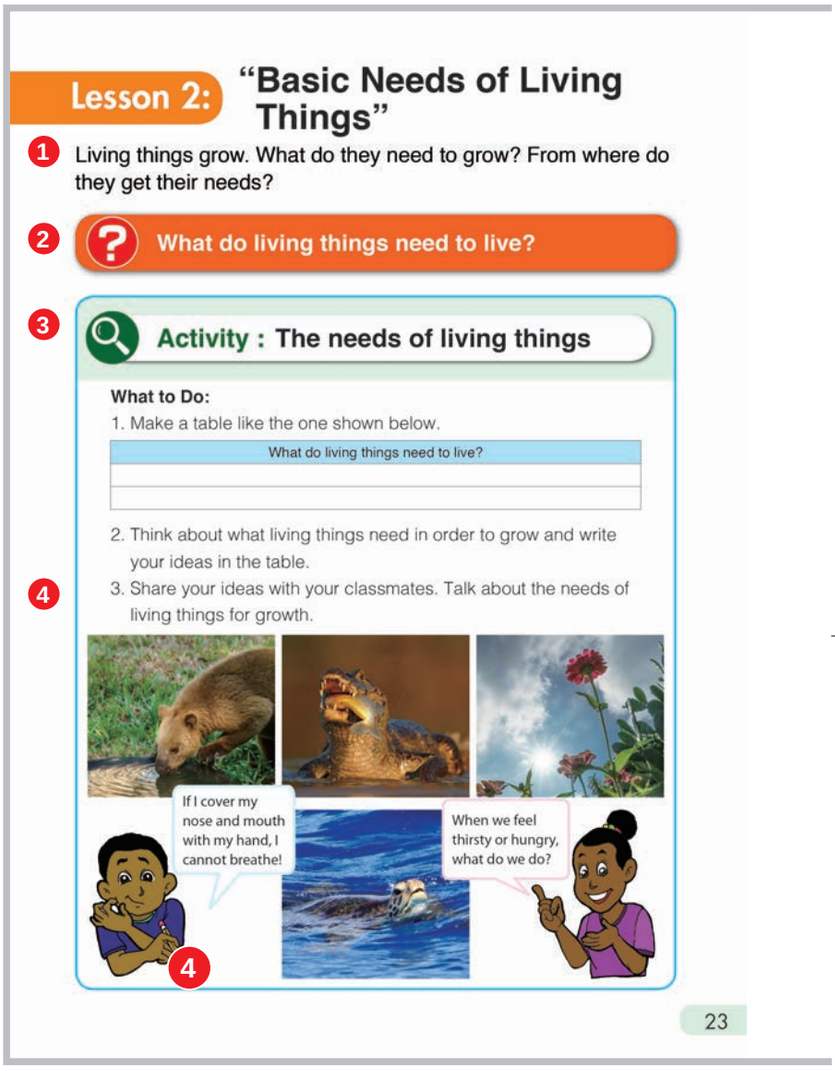
What do living things need to live?

3 Activity (20 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Refer students to the pictures below the activity and the talking characters.
- Ask students to do the activity.
- Check students' activity where necessary.
- Give time for the students to find their answers and fill in their tables.

4 Discussion for findings (20 min.)

- Ask students to present the findings from their activity.
- Write down their findings on a board.
- Facilitate students taking part in the discussions actively. (Continue)



Lesson 2: "Basic Needs of Living Things"

1 Living things grow. What do they need to grow? From where do they get their needs?

2 What do living things need to live?

3 Activity : The needs of living things

What to Do:

1. Make a table like the one shown below.

What do living things need to live?

2. Think about what living things need in order to grow and write your ideas in the table.
3. Share your ideas with your classmates. Talk about the needs of living things for growth.

4

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Teacher's Notes

- The environment in which an animal lives is called 'habitat'. Each plant and animal have their favourite habitat.
- Characteristics of a habitat are usually divided into two components, abiotic and biotic components.
- Abiotic components are non-living factors which include things that are not alive but are necessary for plants and animals to live. Biotic components are living factors pertains to life that affects another organism. They are summarised as below.

Abiotic components	Biotic components
Air (oxygen)	Plants
Sunlight	Predators
Water and humidity	Parasites
Temperature and climate	Competitors
Soil etc.	Decomposers etc.

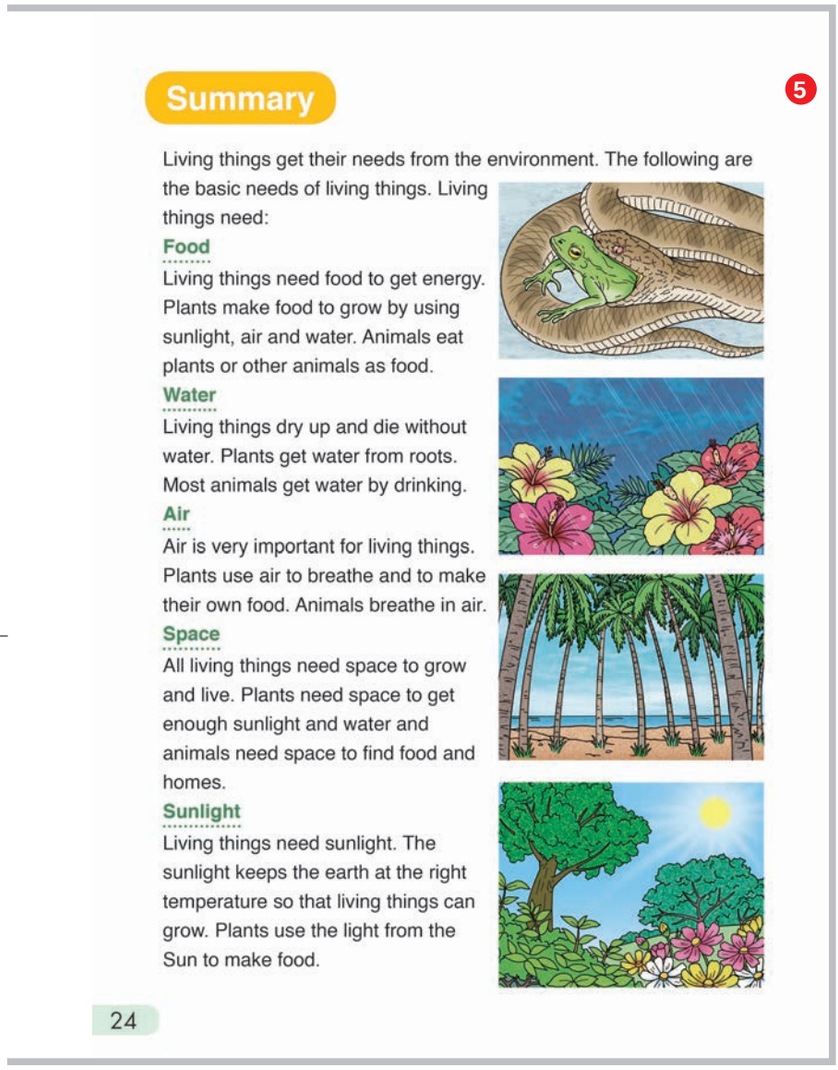
- 'Food' in the textbook is biotic component, and 'water', 'air', 'space' and 'shelter' are abiotic components.
- These components are needed in their environment to live.
- Teachers should facilitate students to implicitly find these two components (living and non-living) to systematically clarify basic needs of plants and animals.

Lesson Objectives

Students will be able to:
- Identify the basic needs of living things.
- Explain the reason why living things need the basic needs.

Assessment

Students are able to:
- Describe how the basic needs help living things to survive.
- List the different kinds of basic needs of living things.
- Participate in the activity with interest.



Summary

5

Living things get their needs from the environment. The following are the basic needs of living things. Living things need:

Food

Living things need food to get energy. Plants make food to grow by using sunlight, air and water. Animals eat plants or other animals as food.

Water

Living things dry up and die without water. Plants get water from roots. Most animals get water by drinking.

Air

Air is very important for living things. Plants use air to breathe and to make their own food. Animals breathe in air.

Space

All living things need space to grow and live. Plants need space to get enough sunlight and water and animals need space to find food and homes.

Sunlight

Living things need sunlight. The sunlight keeps the earth at the right temperature so that living things can grow. Plants use the light from the Sun to make food.

- Confirm that living things need food, water, air space and sunlight with students.
- **Based on their findings,** ask the following questions.

Q:Why do living things need food? (To get energy)
Q:Why do they need water? (To avoid drying up or dying)
Q:Why do they need air? (To breathe and to make a food)
Q:Why do they need space? (To get sunlight. To find food and homes)
Q:Why do living things need food, water, space and sunlight? (To survive and grow)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson. (refer to the blackboard sample)
- Ask the following question as assessment:
  Q: What are the basic needs of living things?
  Q: How do these needs help the plants and animals to survive?
  Q: Why do living things need to get the basic needs?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Basic Needs of Living things"

Key question
What do living things need to live?

Activity
The Needs of Living things

Living Things	What do they need?
Plants	Sunlight,
Animals	Water
Animals	Food
Animals	Air
Plants	Space
Animals	Space

Discussion
Q: Why do living things need food?
To get energy
Q: Why do they need water?
To avoid drying up or dying
Q: Why do they need air?
To breathe and to make a food
Q: Why do they need space?
To get sun light. To find food and homes
Q: Why do they need sunlight?
To keep them warm. To make food
Q: Why do living things need food, water, air, space and sunlight?
To survive and grow

Summary
- All things necessary for living things comes from their environment.
- The basic needs of living things are: food, water, air, space, and sunlight.
- The living things need them to survive and grow.
- Without the basic needs, living things cannot grow and die.

Unit	Chapter : **1. Observing Our Environment**	Total lesson No: 8 / 97
Environment	Topic : **1.2. Interaction between Living things and the Environment**	Textbook page: 25 - 27

Lesson
8 / 9

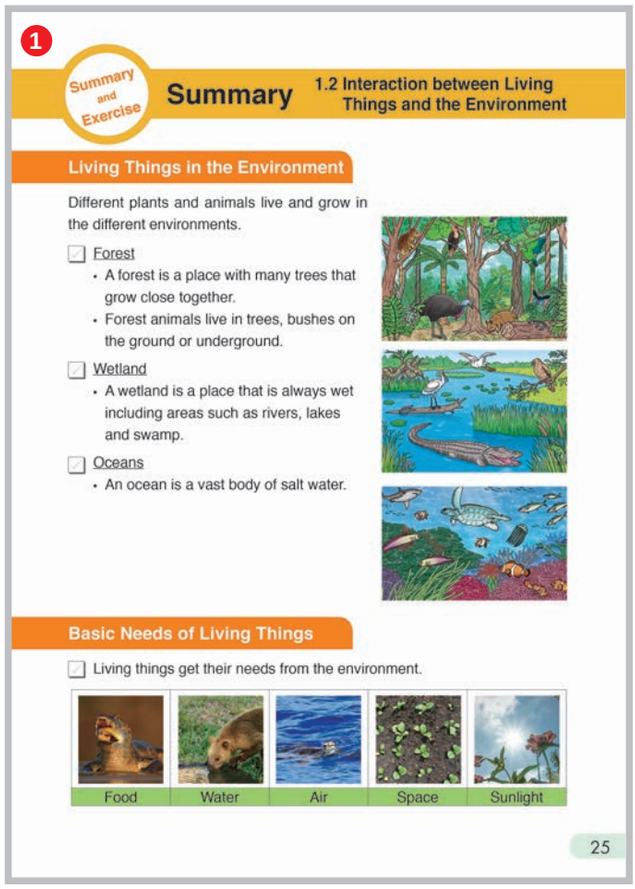
Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (20 min.)

- Recap main learning contents in this topic.
- Ask some focus questions to students and verify student understanding on;
  - How can we find different plants and animals?
  - How does the different environment help the plants and animals?
- Explain and correct learning contents again if they still have misconception.
- Provoke student to give some examples of the different environment.
- Ask students to describe some examples of plants and animals of an environment.



1

Summary and Exercise

Summary 1.2 Interaction between Living Things and the Environment

Living Things in the Environment

Different plants and animals live and grow in the different environments.

☑ Forest
- A forest is a place with many trees that grow close together.
- Forest animals live in trees, bushes on the ground or underground.

☑ Wetland
- A wetland is a place that is always wet including areas such as rivers, lakes and swamp.

☑ Oceans
- An ocean is a vast body of salt water.

Basic Needs of Living Things

☑ Living things get their needs from the environment.

Food | Water | Air | Space | Sunlight

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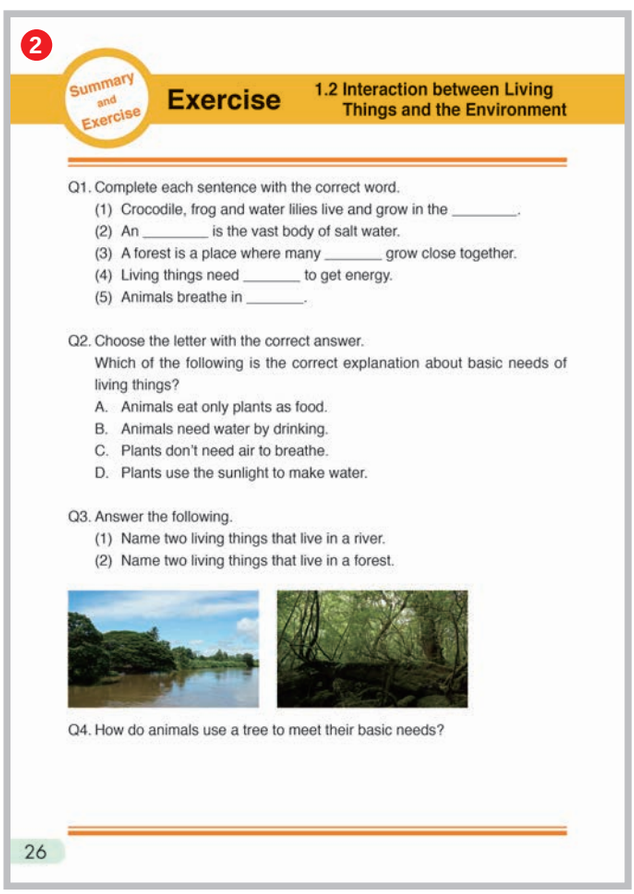
2 Exercise and Explanation (30 min.)

- Explain to students that they will have to answer all questions in the exercise.
- Allow student to try answering questions individually with enough time to response.
- After the test, use student's answers and to answer the question.
- Explain how to solve the answer using the students' thoughts.



2

Summary and Exercise

Exercise 1.2 Interaction between Living Things and the Environment

Q1. Complete each sentence with the correct word.
(1) Crocodile, frog and water lilies live and grow in the _____.
(2) An _____ is the vast body of salt water.
(3) A forest is a place where many _____ grow close together.
(4) Living things need _____ to get energy.
(5) Animals breathe in _____.

Q2. Choose the letter with the correct answer.
Which of the following is the correct explanation about basic needs of living things?
A. Animals eat only plants as food.
B. Animals need water by drinking.
C. Plants don't need air to breathe.
D. Plants use the sunlight to make water.

Q3. Answer the following.
(1) Name two living things that live in a river.
(2) Name two living things that live in a forest.

Q4. How do animals use a tree to meet their basic needs?

26

Exercise answers

Q1.

(1) **wetlands**
The environment is also made of both land and water.

(2) **ocean**
The biggest body of water that tastes salty is the ocean. It is also an environment for a lot of plants and animals

(3) **trees**
A forest is mainly covered with lots of trees which provide a good environment for plants and animals to live in.

(4) **food**
All living things need food to get energy to live and grow.

(5) **air**
All animals need to breathe in air to survive otherwise they will die.

Q2.

B
Plants use the sunlight to make their food.

Q3. Example of the answer:

(1) Living things in a river
Fish, Shrimp, Crab, Water grass

(2) Living things in a forest
Cuscus, Birds, Insects, Tree, Grass
Living things in different environments are different.

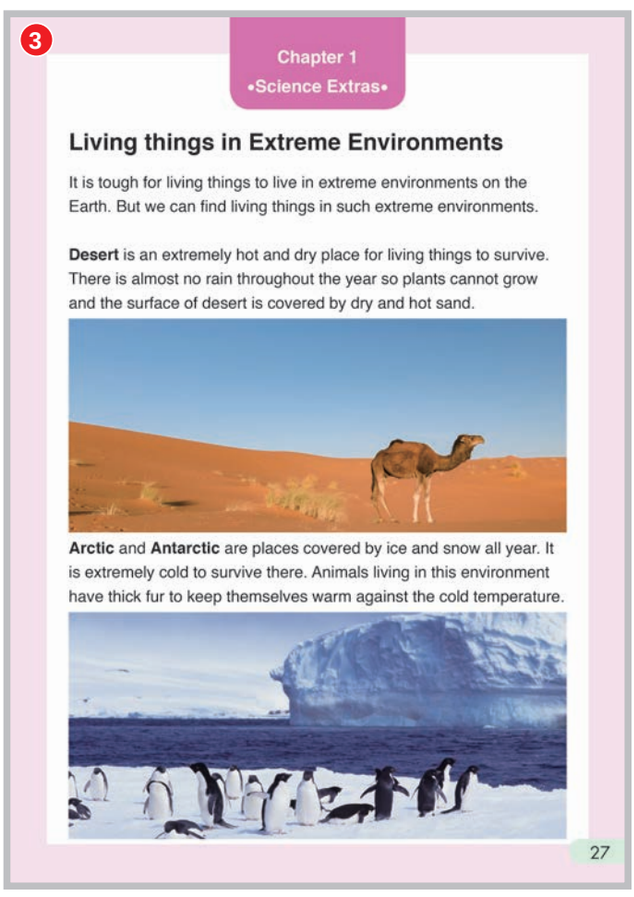
Q4. Example of the answers

- **Some animals eat fruits from trees**
- **Some animals use trees for their home.**

Explanation of Science Extras

3 Science Extras (10 min.)

- Give opportunities to students to closely observe the nature and its phenomena in the world.
- Allow students to ask questions that demonstrate curiosity about the content in the column.



Lesson
9 / 9

Lesson Title

Chapter Test

Answer of the Chapter Test

Chapter Test

1. Observing Our Environment

Q1 Complete each sentence with the correct word.

(1) We all live in the environment, which is everything that makes up our surroundings. Such as air, soil, water, plants, animals, houses, roads, bridges and buildings.

(2) A thing that grows, changes, breathes and reproduces children is called a living thing.

(3) Animals need non-living things for their survival. For example, animals use air to breathe and water to drink.

Q2 Choose the letter with the correct answer.

(1) Which of the following do not explain the use of non-living things by animals?

A. Some animals live in soil.
B. Some animals live in water.
C. Animals use air to breathe.
D. Animals need sunlight to grow.

(2) Why do plants need space shown in the picture?

A. To eat other plants or animals as food.
B. To find food and air.
C. To get enough sunlight and water.
D. To breathe and make their own food.

(3) Which of the following list contains natural things?

A. Tree, soil and water
B. Cars, house and books
C. Fried chicken, grilled fish and shell money
D. Chicken, butterfly and fried meat

(4) Which of the following is the correct explanation about fire?

A. It moves and grows, thus it is living thing.
B. It does not eat and drink, thus it is non-living thing.
C. It breathes and changes, thus it is living thing.
D. It reproduces and moves, thus it is non-living thing.

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Q3

(1) Observe the picture on the right and identify at least three living things and non-living things.

living things: human, tree, grass, etc

non-living things: building, cloud, soil, etc

(2) Identify and categorise the types of living things in the box according to their living place in a particular environment.

Trees, seaweed, snake, dolphins, owl, cuscus, lilies, crocodile, eels, frogs, sharks, heron, tilapia, bird of paradise and whales

List the living things in wetland: snake, lilies, crocodile, eels, frogs, heron, tilapia

(3) Why is it important to grow vegetables in a garden and not inside a house? Explain it from the ideas of the basic needs of living things to grow.

The plants need enough water, space and sunlight, which are difficult to be obtained inside house.

Q4

(1) The moon moves and changes its shape. But it is a non-living thing. Explain why the moon is not a living thing?

Because moon does not eat food. Moon also does not reproduce small moons.

(2) A camel is an animal living in extreme environment called desert. Camels, store fats in their humps on the back and their pee is very little. Explain how their body structure suits their living environment in terms of basic needs of living things.

The desert is covered by dry sand and difficult to find foods and water always. Camel store foods in their hump and spend less water from pee, so that they can survive in extreme environment of desert.

Strand : PHYSICAL SCIENCE
Unit : MATTER

Chapter 2. Properties of Matter

Chapter Objectives

Students will be able to understand the properties of matter by observing objects at various aspects, comparing their weight and volume.

Students will be able to also measure volume and weight of objects with appropriate apparatus.

Topic Objectives

2.1 Describing Matter

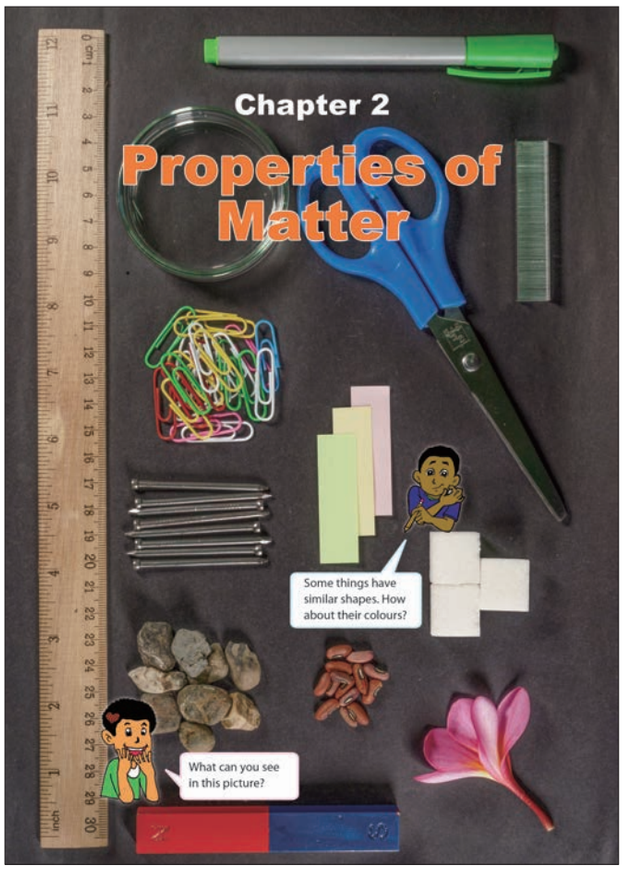
Students will be able to;

- Define that matter is everything around us.
- Describe matter using its properties.
- Compare the weight of matter by using a balance.
- Compare the size of matter by observing rise of the water level when the matter is put into the water in a container.
- Identify matter floating on or sinking in water.
- Identify materials that make an object.

2.2 Measuring Matter

Students will be able to;

- State that matter has its volume as a common property.
- Measure the volume of water by using measuring cylinder or measuring cup.
- Measure the volume of stone by calculating the increase of the water level when the stone is put into the water in a measuring container.
- Explain that the weight of the matter did not change even if its shape changes.
- Explain that different kinds of matter with the same volume have different weight.



Picture in the chapter heading in the textbook shows things used in the textbook as the example of matter.

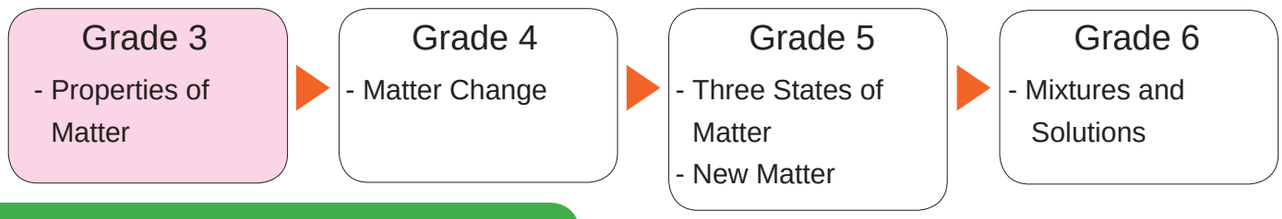
2.3 Mixing Matter

Students will be able to;

- Recognise that no new matter is produced when a mixture is made.
- Separate mixture into each matter by using ways such as sight, magnet, strainer and water.

Related Learning Content

The learning contents in this chapter connect to the following chapters.



Teaching Overview

This chapter consists of 17 lessons, each lesson is a double period.

Topic	Lesson No.	Lesson Title and Key Question	Content standard in syllabus	Textbook page number
2.1 Describing Matter	1	**Matter around Us** What is matter?	3.2.5	31 - 32
	2	**Properties of Matter** How can we describe matter?		33 - 34
	3	**Heavy or Light?** How can we compare the weight of different matter?		35 - 36
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2.2 Measuring Matter	8	**Taking Up Space** What is a common property of matter?		45 - 46
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Unit	Chapter : **2. Properties of Matter**	Total lesson No: 10 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 31 - 32

Lesson 1 / 17

Lesson Title

Matter around Us

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Encourage students to think about matter by asking;

Q:What things did you find outside?

Q:What do you think all things are made of?

- Explain that all things around us are made of matter, and ask;

Q:Can you find matter around you?

2 Introduce the key question

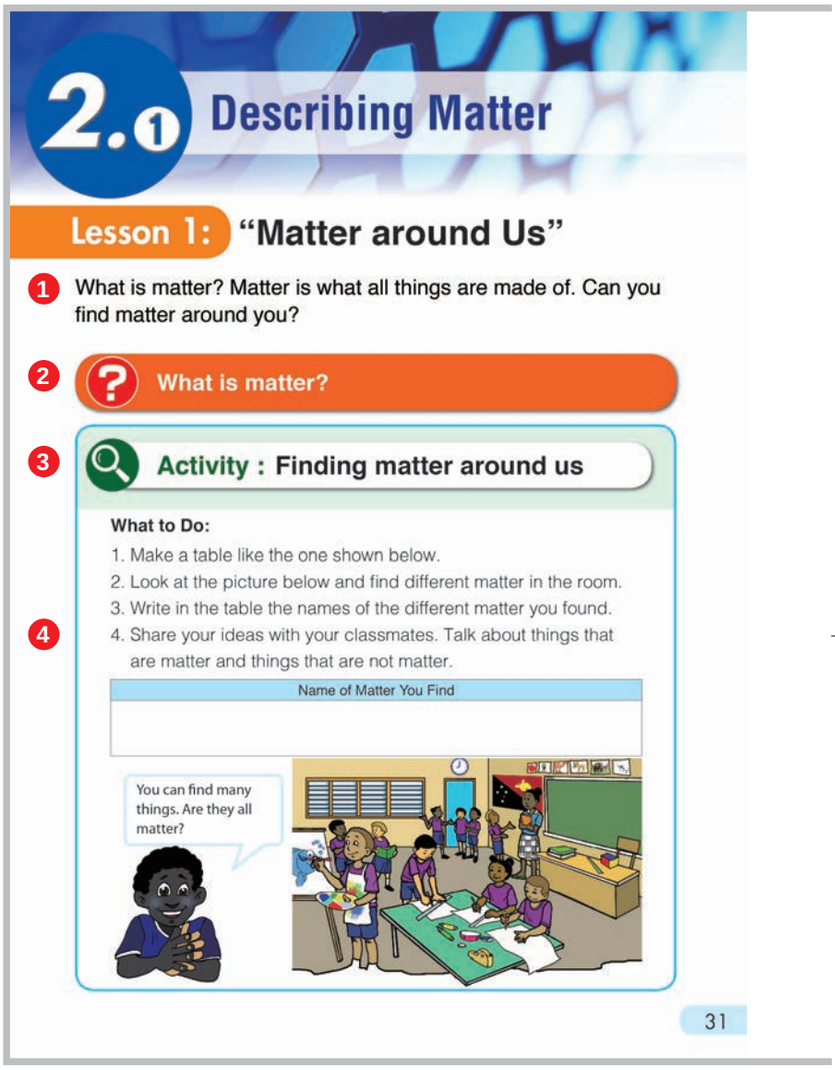
What is matter?

3 Activity (20 min.)

- Organise students to work in pairs
- Explain the steps of the activity
- Have students to do the activity
- Advise students to refer to the picture below the activity and the character's talking in the activity for their investigation.
- Ask students to discuss things that are matter or not. Give enough time for students to freely discuss their ideas in their groups

4 Discussion for findings (20 min.)

- Ask students to present their findings from their activity
- Have students' findings displayed or written on the blackboard. (Continue)



Teacher's Notes

- Matter is the stuff which physically exists around us. It is tangible and visible. It has mass and takes up space. Thus, sound is not a matter. Things mentally exist such as ideas, ideologies, spirits and supersensual ones are not a matter, too. All matters are made of atoms. The atom is one of the smallest things in the world. Matter is found in 3 major states; solid, liquid and gas.
- Students may not believe air is a matter, because it is invisible and is not tangible. But if it is enclosed in a plastic bag, it takes up space. We can feel the air motion when wind blows. Therefore, air is a matter. Air is made up of atoms.
- A material and an object are the similar terminology to a matter. Matter is a kind of umbrella word and a material and an object are more specific. A material is a type of a matter and an object is a form made of a material. For example, a glass cup is the object and the glass are the material of which the glass cup is made.

Facilitation tips

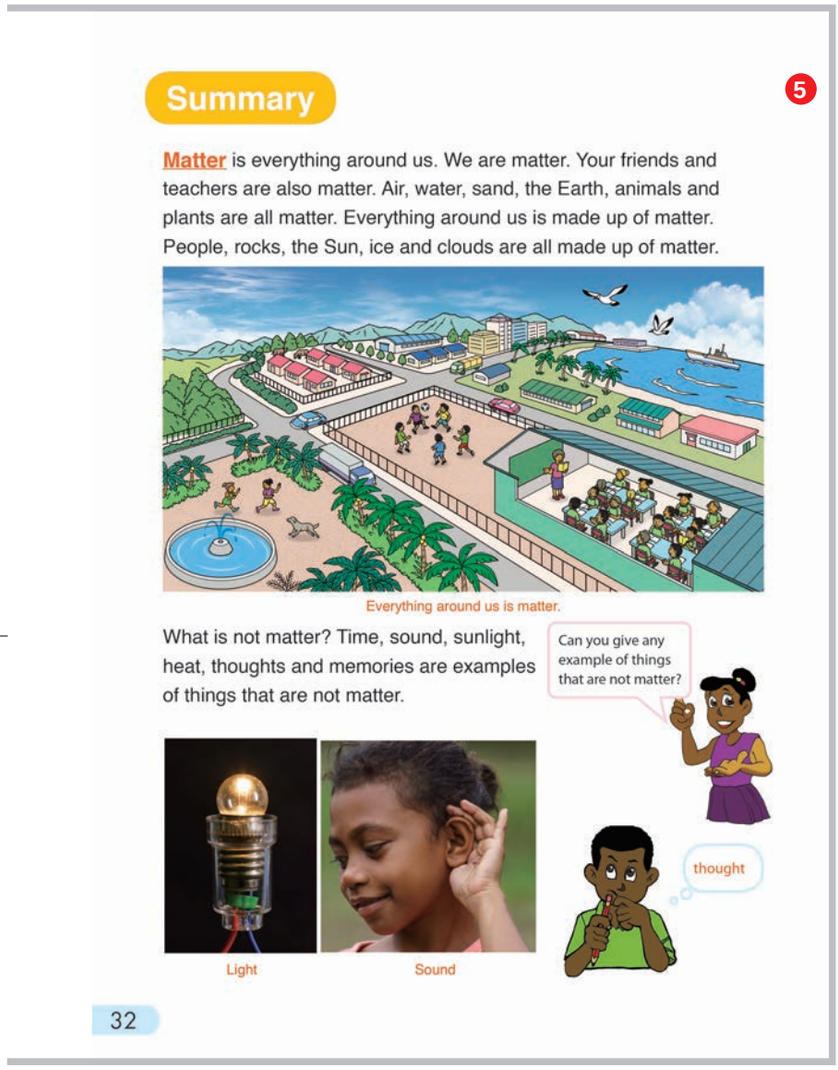
- Before activity, teacher makes sure to remind students of safety ground rules when taking them outside.
- Bear in mind that the introduction activity is a lead up activity to the main activity therefore try to make it interesting as this is the first lesson for the unit. (matter).

Lesson Objectives

Students are able to:
- Define matter
- Identify which is matter or not matter.

Assessment

Students are able to:
- Explain what matter is
- List different kinds of matter found around them
- Give some examples of things that are not matter.
- Investigate in cooperation with classmates



Summary

5

Matter is everything around us. We are matter. Your friends and teachers are also matter. Air, water, sand, the Earth, animals and plants are all matter. Everything around us is made up of matter. People, rocks, the Sun, ice and clouds are all made up of matter.

Everything around us is matter.

What is not matter? Time, sound, sunlight, heat, thoughts and memories are examples of things that are not matter.

Can you give any example of things that are not matter?

thought

Light

Sound

32

- Facilitate students to take part in the discussion actively
- Confirm the findings with students.
- B**ased on their results,** ask these questions.

Q:What things are matter in our classroom?
(Friends, table, chair, notebook, textbook, pen, etc)

Q:Can you guess what things are not matter?
(Light, shadow, ideas, thinking, talking, time, etc)

Q:Why do you think so? (It depends on students)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard. (refer to Blackboard sample)
- Ask the following questions for assessment:
  Q: What is matter?
  Q: Give some examples of matter around us.
  Q: Give some examples of the things that are not matter around us.
- Allow time for students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Matter around us"

Key question
What is matter?

Activity
Finding matter around us

Name of matter you find
Chair, television, table, blackboard, students, teacher, chart, books, paints and brushes.

Discussion
Q: What things are matter in our classroom?
Friends, table, chair, note, textbook, pen, etc
Q: Can you guess what things are not matter?
Light, shadow, ideas, thinking, talking, time, etc
Q: Why do you think so?
It depends on students.

Summary
- Matter is everything around us.
- Air, water, sand, the Earth, animals, and plants are all matter.
- Matter is what all things are made of.
- Everything around us is made up of matter.
- But, some things are not matter. Time, sound, sunlight, heat, thoughts, and memories are example of something that is not matter.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 11 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 33 - 34

Lesson 2 / 17

Lesson Title

Properties of Matter

Preparation

- Nil

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson:

Q:What is matter?
Q:Give some examples of matter around us
Q:Give some examples of the things that are not matter around us

- Encourage students to think about the properties of matter by asking:

Q:How are those matter similar or different?

2 Introduce the key question

How can we describe matter?

3 Activity (20 min.)

- Organise students in groups.
- Explain the steps of the activity.
- Refer students to the characters' talking for their investigation.
- Have students do the activity and ask them to record their findings in the table.
- Teacher can use actual oranges and a basketball instead of the pictures.
- Ask students to discuss how they described the two objects based on their findings in a group.

4 Discussion for findings (25 min.)

- Ask students to present their findings from their activity. (Continue)

Teacher's Notes

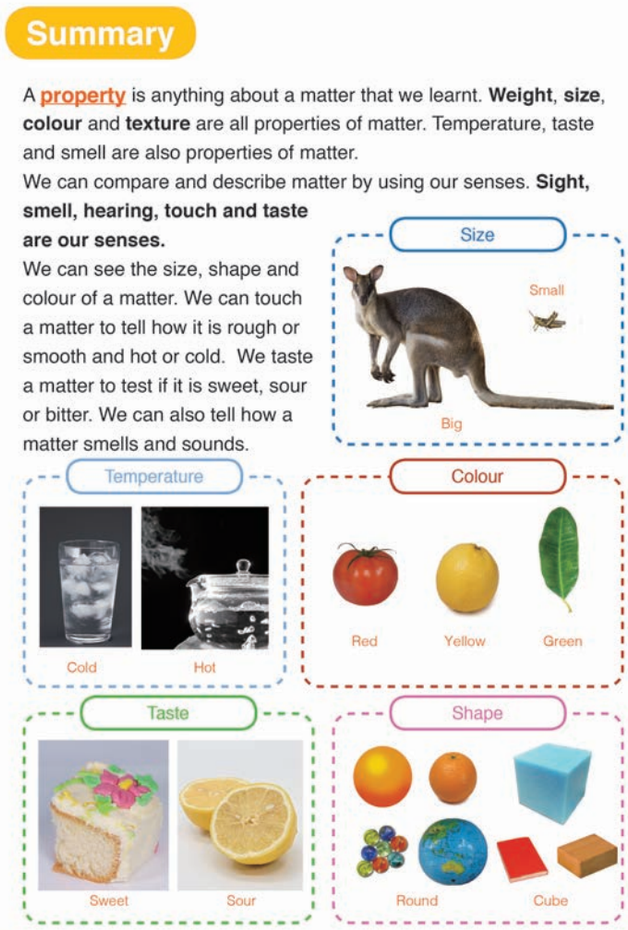
- Matter physically exists. Thus, it can be characterised physically. It is tangible, its texture can be described. It is visible, its colour and shape should be argued. It has mass, its weight will be measured. It takes up space, its size and volume must be defined.
- Those characteristics are scientifically called physical properties of a matter. In this activity, students practice how they tell properties in scientific manner. Teachers should be creative to prepare various objects to encourage students describe the similarities and differences when comparing their properties with the following questions;
  - **Texture**: How does it feel like rough or smooth?
  - **Temperature**: How is it hot or cold?
  - **Colour**: What is the colour? How is it dark or bright?
  - **Shape**: What does it look alike?
  - **Size**: How long? How big?
  - **Weight**: How is it heavy or light?
  - **Taste** and **smell**: How does it taste like? How does it smell like?

Lesson Objectives

Students will be able to:
- Describe the properties of matter using their senses.
- Observe the properties of different matter.

Assessment

Students are able to:
- List different properties of matter using our senses.
- Compare the similarities and differences of the properties of matter.
- Investigate the properties of matter with interest.



- Write down students' findings on the blackboard
- Confirm the findings with students
- **Based on their observation,** ask these questions.

Q:How do they look alike? (They are round, the colours are orange.)

Q:How do they look different? (An orange is smaller than a ball, smell is different, a ball is heavier than an orange, etc)

Q:How did you describe the similarities and differences of the two objects? (Colour, shape, size, weight, texture, smell, etc)

Q:What body parts did you use to compare the orange and the ball? (Eyes to look, hand to touch, nose to smell, mouth to taste, ears to hear)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard. (refer to Blackboard sample)
- Ask the questions for assessment:
  Q:How can we describe matter?
  Q:What senses do you use to describe matter?
  Q:Give some examples of the properties of matter?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"Properties of Matter"

Key question

How can we describe matter?

Activity

Describing Matter

How they are similar	How they are different
• They are both orange in colour • They are both round • They both roll	• A basketball ball is heavier than an orange • An orange gives off a smell

Discussion

Q: How do they look alike?

They are round, the colours are orange.

Q: How do they look different?

An orange is smaller than a ball, smell is different, a ball is heavier than an orange, etc

Q: How did you describe the similarities and differences of the two objects?

Colour, shape, size, weight, texture, smell, etc

Q: What body parts did you use to compare the orange and the ball?

Eyes to look, hand to touch, nose to smell, mouth to taste, ears to hear

Summary

- A property is anything that we learn about a matter.
- Weight, size, colour, texture, temperature, taste, and smell are the properties of matter.
- We can compare and describe matter by using our senses.
- Sight, smell, hearing, touch, and taste are our senses.
- The properties of matter can be observed by seeing, smelling hearing, touching and tasting.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 12 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 35 - 36

Lesson 3 / 17

Lesson Title

Heavy or Light?

Preparation

- A balance or material for improvising beam balance
- Different coins- 10t, 20t, 50t, K1

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson

Q:How can we describe matter?

Q:Give some examples of the properties of matter?

- Motivate students to think about weight by asking:

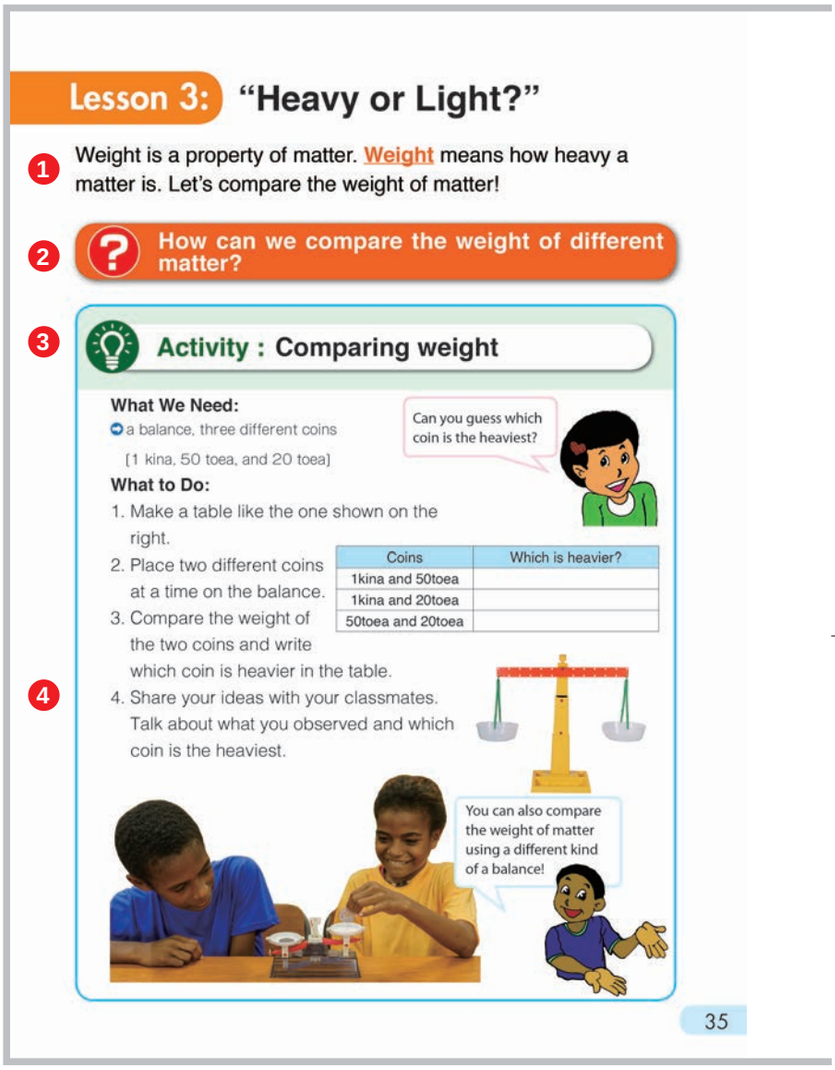
Q:Weight is one of the properties of matter, but how can we compare the weight of matter?

2 Introduce the key question

How can we compare the weight of different matter?

3 Activity (25 min.)

- Arrange students into some groups.
- Explain the steps of the activity.
- Ask students to draw the table in their exercise books.
- Demonstrate and explain how to use a balance.
- Ask students to guess which coin is heavier or lighter and to record their prediction in their exercise book.
- Have students do the activity based on their prediction and record their results in the table.
- Ask students to discuss which coin is the heaviest among the three coins based on their findings in their group.



Lesson 3: "Heavy or Light?"

1 Weight is a property of matter. Weight means how heavy a matter is. Let's compare the weight of matter!

2 How can we compare the weight of different matter?

3 Activity : Comparing weight

What We Need:
a balance, three different coins
[1 kina, 50 toea, and 20 toea]

What to Do:
1. Make a table like the one shown on the right.
2. Place two different coins at a time on the balance.
3. Compare the weight of the two coins and write which coin is heavier in the table.
4. Share your ideas with your classmates. Talk about what you observed and which coin is the heaviest.

Coins	Which is heavier?
1kina and 50toea	
1kina and 20toea	
50toea and 20toea	

Can you guess which coin is the heaviest?

You can also compare the weight of matter using a different kind of a balance!

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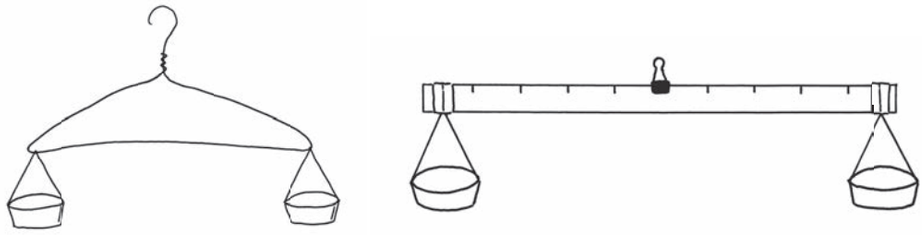
Teacher's Notes

IMPROVISATION FOR A BEAM BALANCE

A balance shown in the textbook is specially called 'a double pan balance'. There are two types of the double pan balance. One is like the above diagram in which pans are placed on the upper side of the beam. The other type is the one in which the beam hangs pans. This 'hanging pan balance' is easier for improvisation. A hanger is a convenient material to create simple double pan balance as shown in Fig. 1. A ruler with crocodile clips provides you a quick but accurate improvised balance, too.

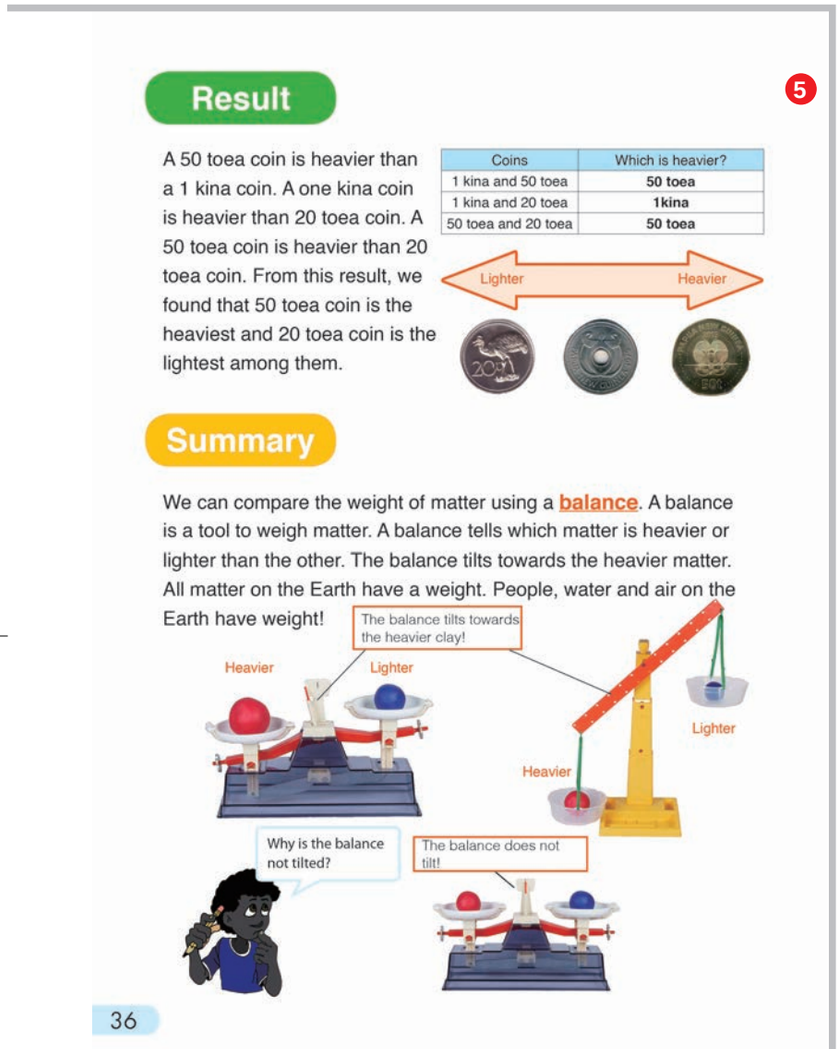


Lesson Objectives

Students will be able to:
- Compare weights of matter with a beam balance.
- Explain the function of a beam balance.

Assessment

Students are able to:
- Identify which coin is heavier or lighter amongst three different coins.
- Describe how a beam balance works for comparing the weight of matter.
- Show eagerness towards investigation.



Result

A 50 toea coin is heavier than a 1 kina coin. A one kina coin is heavier than 20 toea coin. A 50 toea coin is heavier than 20 toea coin. From this result, we found that 50 toea coin is the heaviest and 20 toea coin is the lightest among them.

Coins	Which is heavier?
1 kina and 50 toea	50 toea
1 kina and 20 toea	1kina
50 toea and 20 toea	50 toea

Lighter Heavier

Summary

We can compare the weight of matter using a balance. A balance is a tool to weigh matter. A balance tells which matter is heavier or lighter than the other. The balance tilts towards the heavier matter. All matter on the Earth have a weight. People, water and air on the Earth have weight!

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4 Discussion for findings (25 min.)

- Let students observe and record their result in the table.
- Write down students' results on the blackboard.
- Confirm the findings with students.
- **Based on their results,** ask these questions.

Q:When you placed 1 kina coin and 50 toea coin on a balance, which direction did the balance tilt to? (It tilted towards the 50 toea coin)

Q:Why did the balance tilt towards the 50 toea coin? (Because the 50 toea coin is heavier than the 1kina coin)

Q:Which coin is the heaviest or lightest among the three coins? Why? (50 toea coin is the heaviest and 20 toea coin is the lightest among them.)

- Conclude the discussion.

5 Summary (5 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard. (refer to Blackboard sample).
- Ask the questions for assessment:
  Q:What is the meaning of weight?
  Q:How does a balance work when two objects are placed on it?
  Q:When we place two objects on a balance, it does not tilt. Explain why the balance is not tilted?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"Heavy or Light?"

Key question

How can we compare the weight of different matter?

Activity

Comparing weight

Coins	Which is heavier?
1 kina and 50 toea	50 toea
1 kina and 20 toea	1 kina
50 toea and 20 toea	50 toea

(Student's prediction)

Discussion

Q: When you placed 1 kina coin and 50 toea coin on a balance, which direction did the balance tilt to? 50 toea coin

Q: Why did the balance tilt towards the 50 toea coin?

Because the 50toea coin is heavier than 1 kina coin

Q: Which coin is the heaviest or lightest among three coins? Why?

50 toea coin is the heaviest and 20 toea coin is the lightest among them.

Summary

- Weight means how heavy a matter is.
- We can compare the weight of matter using a balance.
- A balance is a tool to weigh a matter.
- A balance tells which of a matter is heavier or lighter than another.
- A balance tilts toward a heavier matter.
- When two matter have the same weight, the balance does not tilt.
- All matter on the Earth have a weight.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 13 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 37 - 38

Lesson
4 / 17

Lesson Title

Big or Small?

Preparation

- Two same kind of glass cups
- Water, rubber band
- Two different stones

Lesson Flow

1 Introduction (5 min.)

- Review previous lesson:

Q:How can we compare the weight of matters?

- Motivate students to think about how to compare the size of matter by asking:

Q:Size is one of the properties of matter, but how can we compare the size of matter?

2 Introduce the key question

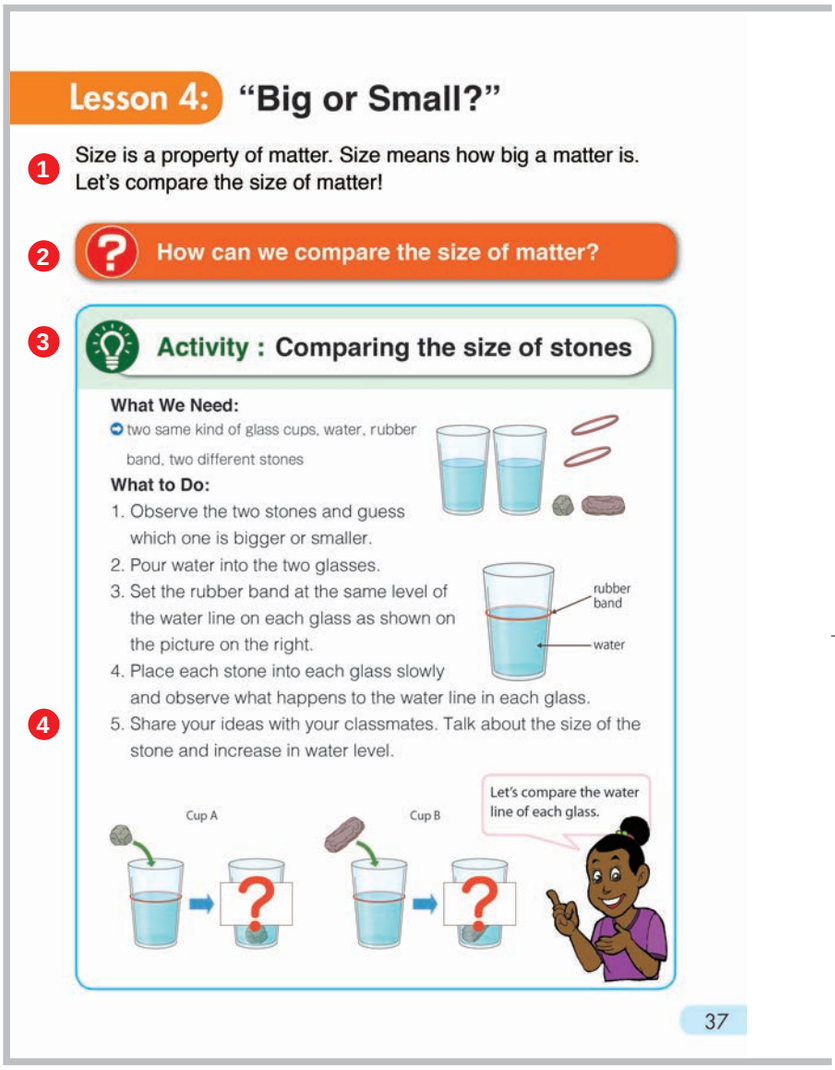
How can we compare the size of matter?

3 Activity (20 min.)

- Arrange students into some groups.
- Explain the steps of the activity
- Advise students on safety rules.
- Demonstrate how to set up the activity
- Ask students to guess which stone is bigger or smaller and to record their prediction in their exercise book.
- Have students do the activity based on their prediction and record the results in their exercise book.
- Allow enough time for students to carry out their investigation.

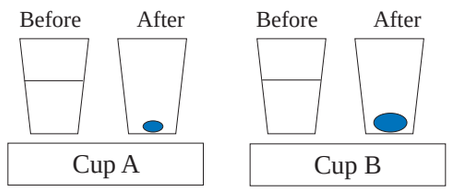
4 Discussion for findings (25 min.)

- Ask students to present their results from their activity. (Continue)



Teacher's Notes

- Prior to teaching the lesson, teacher must try out the activity to prepare proper size of stones for getting the intended results. The activity requires to show the clear difference between the small and the big stones. Teachers who don't try before the lesson tend to prepare too big stone which cannot be placed in the cup or pushes water spill out of the cup.
- **Prediction (guessing)** prior to the activity is also important for students, as the activity itself is very simple. Teachers are requested to take enough time to elaborate students' prediction so that students are more actively engaged in the activity. To do that, illustrations of glass cups without water line can help more than the real cup to facilitate students' thinking. Teachers ask students to copy the illustration and draw lines for their prediction. The same illustration should be used for the presentation and discussion of their observation result.



Lesson Objectives

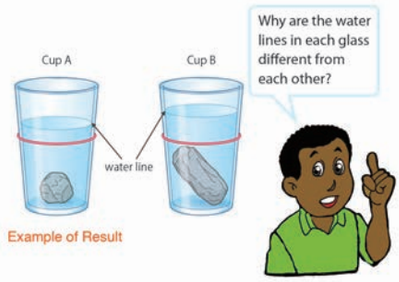
Students will be able to:
- Compare the different size of matter.
- Infer which object is bigger or smaller based on the results of the activity.

Assessment

Students are able to:
- Describe how to compare the size of matter.
- Relate the size of matter to the amount of water increased in a container.
- Show eagerness to investigate how to compare the size of matter.

Result

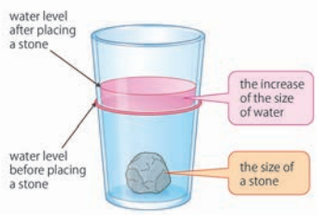
When we placed the stones into each glass, the water lines in the glasses rose. The water line of Cup B is higher than that of Cup A.



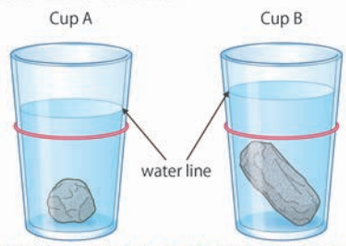
Example of Result

Summary

When we place matter into water in a container, the level of water line will rise. This is because the size of water in the container increases by the same amount as the size of the matter.



So, the bigger the matter is, the higher the water level in a container rises. We can compare the size of matter by observing the increase of the size of water in the container.



The bigger the stone is, the higher the water level in the container is.

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- Write down students' results on the blackboard.
- Confirm the results with students.
- **Based on their findings,** ask these questions.

Q:Why did the water lines in the glasses rise when we placed the stones into the glasses? (The size of water in a glass increased by the same amount as the size of the stone.)

Q:Why are the water lines in each glass different from each other? (This is because the size of the stones are different)

Q:What happened to the water lines when we placed a bigger stone into a glass? (The bigger a stone is, the higher the water line is.)

Q:Which stone is bigger or smaller? (Stone in Cup B)

- Conclude the lesson

5 Summary (10 min.)

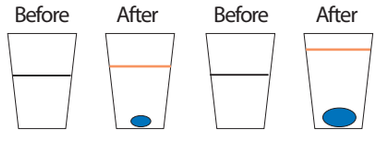
- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard. (refer to Blackboard sample)
- Ask the questions for assessment:
  Q:What is the meaning of size?
  Q: How can we compare the size of matter?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Big or Small?"

Key question
How can we compare the size of matter?

Activity
Comparing the size of stones



Discussion

Q: Why did the water lines in the glasses rose when we placed the stones into the glasses?
The size of water in a glass increased by the same amount as the size of the stone.

Q: Why are the water lines in each glass different from each other?
This is because the size of the stones are different.

Q: What happened to the water lines when we place a bigger stone into a glass?
The bigger a stone is, the higher the water line is.

Q: Which stone is bigger or smaller?
Stone in Cup B

Summary
- Size means how big a matter is.
- We can compare the size of matter by observing the increase of the size of water in a container.
- The increase of the amount of water is equal to the size of a stone.
- The bigger the matter is, the higher the water level in a container rises.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 14 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 39 - 40

Lesson 5 / 17

Lesson Title

Float or Sink?

Preparation

- Wood,
- stone,
- glass cup,
- clear container or bowl and water

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson:

Q:What is the meaning of size?

Q:How can we compare the size of matter?

- Encourage students to think about floating and sinking of matter by asking:

Q:When we place some matter in water, what will happen?

2 Introduce the key question

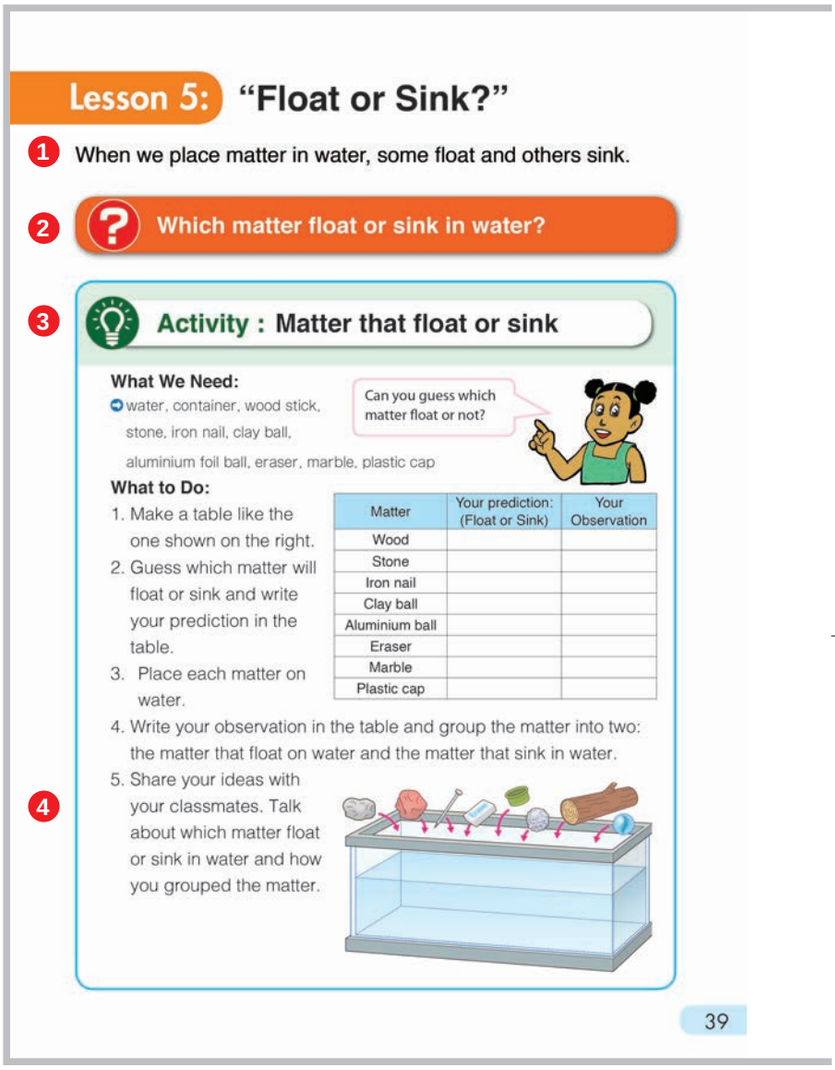
Which matter floats or sinks in water?

3 Activity (25 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Ask students to draw the table into their exercise books.
- Let students predict which matter will float or sink in water and record their predictions in the table.
- Have students carry out the activity and ask them to record their results in the table.
- Ask students to discuss which matter floated or sunk in the water based on their findings in their groups.

4 Discussion for findings (20 min.)

- Ask students to present their results from their activity. (Continue)



Lesson 5: "Float or Sink?"

1 When we place matter in water, some float and others sink.

2 Which matter float or sink in water?

3 Activity : Matter that float or sink

What We Need:

water, container, wood stick, stone, iron nail, clay ball, aluminium foil ball, eraser, marble, plastic cap

Can you guess which matter float or not?

What to Do:

1. Make a table like the one shown on the right.
2. Guess which matter will float or sink and write your prediction in the table.
3. Place each matter on water.
4. Write your observation in the table and group the matter into two: the matter that float on water and the matter that sink in water.
5. Share your ideas with your classmates. Talk about which matter float or sink in water and how you grouped the matter.

Matter	Your prediction: (Float or Sink)	Your Observation
Wood		
Stone		
Iron nail		
Clay ball		
Aluminium ball		
Eraser		
Marble		
Plastic cap		

4

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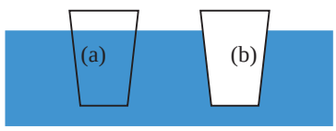
Teacher's Notes

Why does an object sink or float? (This knowledge is for teachers only. Teacher should not teach this as it is too difficult for students.)

- Students commonly believe that heavy objects sink and light objects float regardless of their size, shape or the type of material used to make them. But ships made of iron which may be known as a heavy object can float. Why?
- An object which has a greater mass than an equal volume of water sinks and an object which has a smaller mass than an equal volume of water floats. The way to compare a mass per a unit volume is called 'density', that is to say, an object more dense than water sinks and less dense than water float, scientifically.
- For instance, the cup (a) which is filled with water will sink because the mass of the objects equal;
  mass of the object (a) = mass of the cup + mass of water
  mass of the object (b) = mass of the cup + mass of air



Therefore, the object (a) will sink since it has a greater mass than an equal volume of water and the object (b) will float as it has a smaller mass than an equal volume of water.

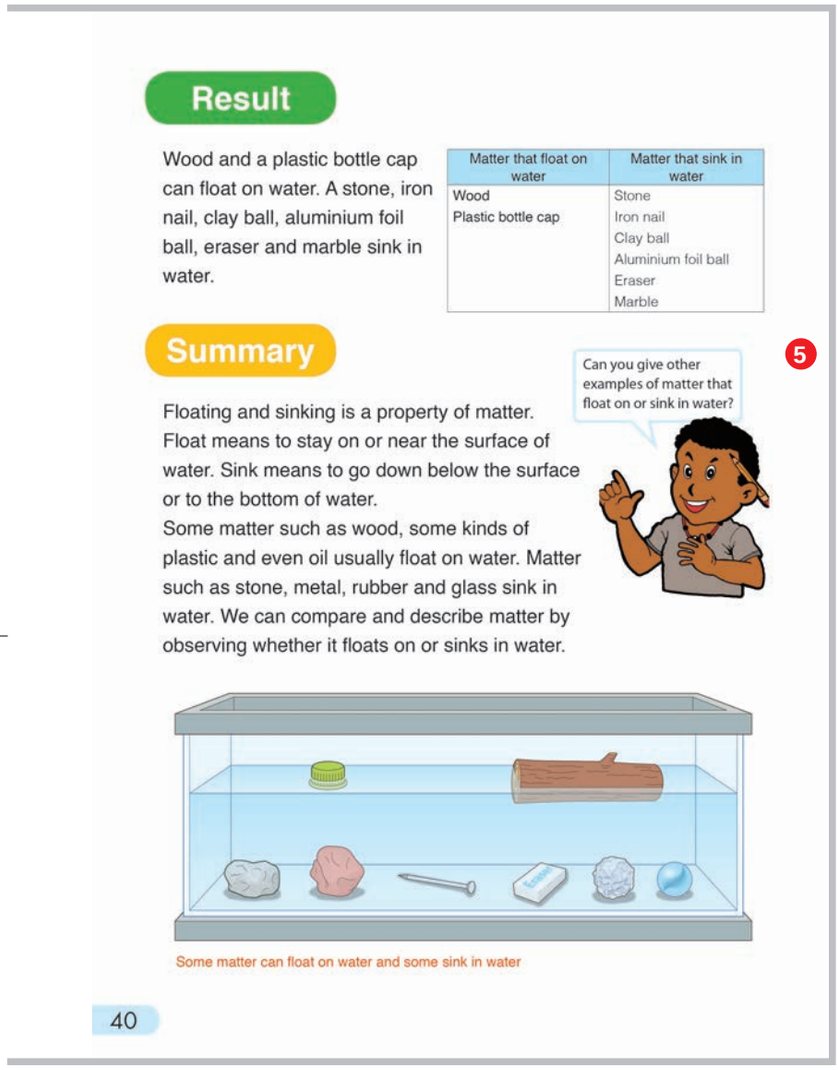
- The size, shape and material of objects determine if they sink or float. Teachers need to prepare various types of objects to guide students to understand that there are objects which can both sink and float.

Lesson Objectives

Students will be able to:
- Recognize that float and sink are properties of matter.
- Observe the different types of matter that can float or sink in water.

Assessment

Students are able to:
- Identify matters that can float and sink in water.
- Group objects according to their ability to float and sink.
- Actively participate in the investigation.



Result

Wood and a plastic bottle cap can float on water. A stone, iron nail, clay ball, aluminium foil ball, eraser and marble sink in water.

Matter that float on water	Matter that sink in water
Wood	Stone
Plastic bottle cap	Iron nail
	Clay ball
	Aluminium foil ball
	Eraser
	Marble

Summary

Floating and sinking is a property of matter. Float means to stay on or near the surface of water. Sink means to go down below the surface or to the bottom of water.
Some matter such as wood, some kinds of plastic and even oil usually float on water. Matter such as stone, metal, rubber and glass sink in water. We can compare and describe matter by observing whether it floats on or sinks in water.

5

Some matter can float on water and some sink in water

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- Write students' results on the blackboard.
- Confirm the results with students.
- Let the students compare their prediction to the result and confirm.
- **Based on their observation,** ask these questions as points of discussion.

Q:Which matter can float on water or sink in water? (Wood and plastic cap floated on water.)

Q:How can you group the matter you tested from this activity? (They can be grouped into two groups, Matter that floats on water and Matter that sinks in water.)

- Conclude the findings.

5 Summary (5 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard.
- Ask the following questions as assessment:
  Q: How can we compare and describe matter when we place matter on water?
  Q: What are some examples of matter that float on water and sink in water?
- Ask students to copy the notes on the blackboard in their exercise book.

Sample Blackboard Plan

Title:
"Float or Sink?"

Key question
Which matter float or sink in water?
Activity Matter that floats or sinks.

Matter	Your Prediction: Float or sink?	Your observation
Wood	Float	Float
Stone	Sink	Sink
Clay ball	Sink	Sink
...	...	...

Discussion
Q: Which matter can float on water?
Wood and plastic cap floated on water.
Q: Which matter sinks in water?
Stone, iron nail clay ball, aluminum ball, eraser and marble sank in water.
Q: How can you group the matter you tested from this activity?
They can be grouped into two groups, Matter that floats on water and Matter that sinks in water.

Summary
- Float and sink are a property of matter.
- Float means to stay on or remain on the surface of water.
- Sink means to go down below the surface or bottom of water.
- Matter that can float are wood, plastic cap, leaves,
- Matter that can sink are stone, iron nail, clay ball etc.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 15 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 41 - 42

Lesson 6 / 17

Lesson Title

What Matter Do We Use?

Preparation

- Nil

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson:

Q:How can we compare and describe matter when we place matter on water?

- Explain what an object is and ask the question by showing an object:

Q:What is it made from? What matter is used to make it?

2 Introduce the key question

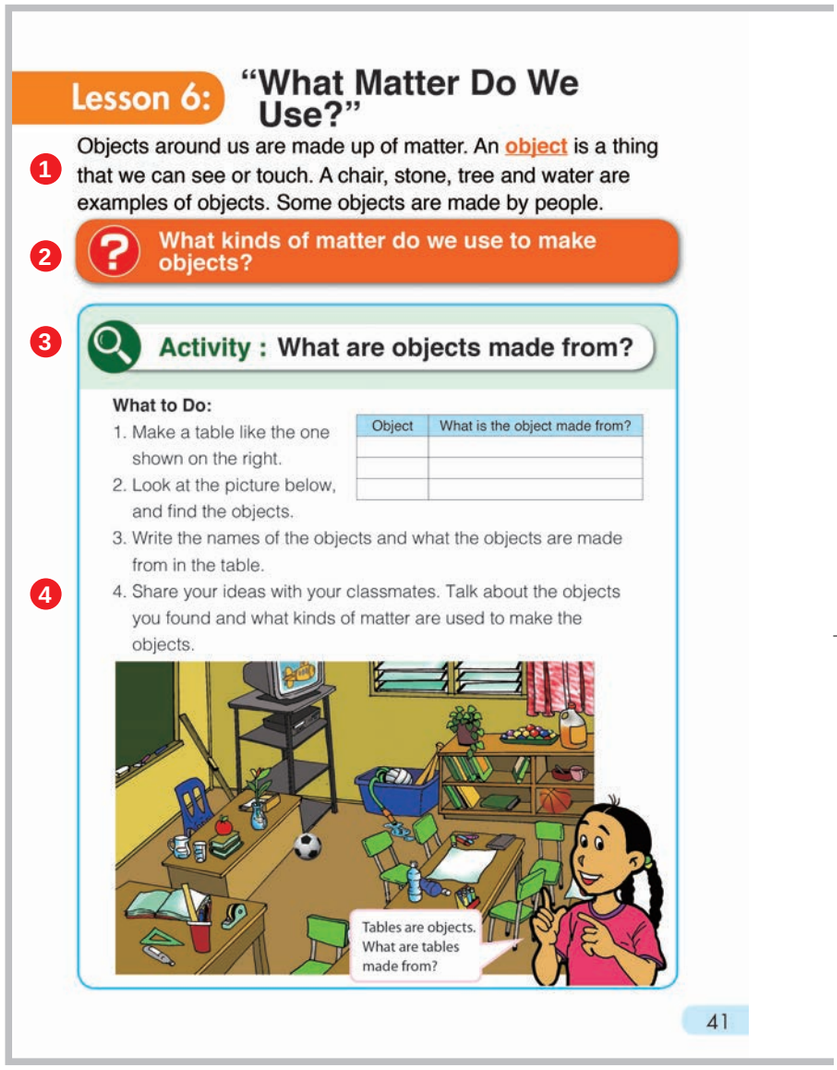
What kinds of matter do we use to make objects?

3 Activity (25 min.)

- Organise students in some groups.
- Explain the steps of the activity.
- Ask students to draw the table in their exercise book.
- Advise students to refer to the picture in the activity and character's talking for their investigation.
- Have students do the activity and ask them record their findings in the table.
- Ask students to discuss what kinds of matter are used to make the object based on their findings in a group.

4 Discussion for findings (20 min.)

- Ask students to present their findings from their activity. (Continue)



Lesson 6: "What Matter Do We Use?"

1 Objects around us are made up of matter. An object is a thing that we can see or touch. A chair, stone, tree and water are examples of objects. Some objects are made by people.

2 What kinds of matter do we use to make objects?

3 Activity : What are objects made from?

What to Do:

1. Make a table like the one shown on the right.
2. Look at the picture below, and find the objects.
3. Write the names of the objects and what the objects are made from in the table.
4. Share your ideas with your classmates. Talk about the objects you found and what kinds of matter are used to make the objects.

Object	What is the object made from?

4

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Teacher's Notes

Properties of matters introduced in the textbook are summarised as below for additional knowledge for teachers.

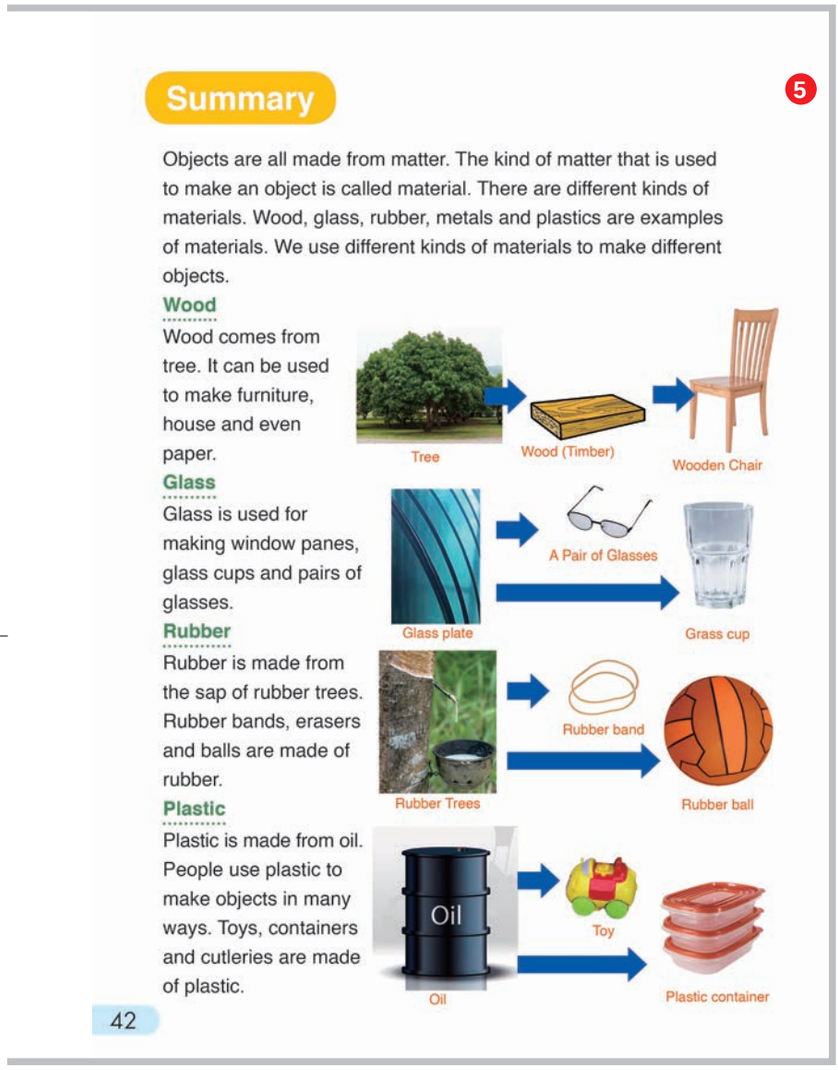
Wood	Wood is made of trees, more specifically, trunks and branches of trees. Their colour is generally brown. Some of their scent is notably odorous or aromatic. They are normally less dense than water thus, they float. However, some woods such as Ebony, Desert Ironwood and Lignum Vitae are more dense than water and they sink.
Glass	Glass is composed mainly of a certain kind of sand (silicate) and an alkali. It is a hard material normally fragile and transparent. It is 100% recyclable. Its density is approx. 2.5 g/cm3 and thus it sinks in water. It is an excellent insulator against heat, electricity and electromagnetic radiation.
Rubber	As shown in the textbook, natural rubber is made of latex which is a milky sap oozes from a rubber tree (Hevea brasiliensis). Rubber is one of the main crops for export in PNG. The major property of rubber is elasticity. It is also used to erase pencil marks by rubbing markings on paper. Its density is 0.92 g/cm3 and thus it floats on water.
Plastic	Plastic is a synthetic material created from naphtha (distilled product of oil). It can be manufactured inexpensively and mass produced. It is lightweight, water and shock resistant and, thermally and electrically insulating. Since it is artificially made in industries, there are numerous types of plastics. Some are denser and some others are less dense than water.

Lesson Objectives

Students will be able to:
- Define what a material is.
- Identify the different kinds of materials.

Assessment

Students are able to:
- Explain the differences among matters, objects and materials.
- Describe what materials are used to make an object.
- Listen to the opinions from others with respect.



Summary

Objects are all made from matter. The kind of matter that is used to make an object is called material. There are different kinds of materials. Wood, glass, rubber, metals and plastics are examples of materials. We use different kinds of materials to make different objects.

Wood

Wood comes from tree. It can be used to make furniture, house and even paper.

Tree — Wood (Timber) — Wooden Chair

Glass

Glass is used for making window panes, glass cups and pairs of glasses.

Glass plate — A Pair of Glasses — Grass cup

Rubber

Rubber is made from the sap of rubber trees. Rubber bands, erasers and balls are made of rubber.

Rubber Trees — Rubber band — Rubber ball

Plastic

Plastic is made from oil. People use plastic to make objects in many ways. Toys, containers and cutleries are made of plastic.

Oil — Toy — Plastic container

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- Write students' findings on the blackboard.
- Confirm the results with students.
- **Based on their findings,** ask these question.

Q:What kinds of matter are used to make objects? (Wood, glass, rubber, plastic, metal, paper, etc)

Q: Why is a glass used to make a window? (Because the glass is transparent.).

Q:Why is ball made from rubber? (Because the rubber is elastic and bouncy.)

Q:How do we choose matter when we make an object? (We choose the best matter for the object based on its properties.)

- Conclude the discussion

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise the day's lesson on the black board.
- Ask the questions for assessment:

Q:What is the meaning of objects?

Q:What is the meaning of materials?

Q:What is an object made of?

Q:Give some examples of different kinds of materials.

- Ask students to copy the notes on the blackboard into their exercise books

Sample Blackboard Plan

Title:

"What Matter Do We Use?"

Key question What kinds of matter do we use to make objects?

Activity What are objects made from?

Object	What is the object made from?
Chair	Plastic, steel
Table	Wood
Window	Glass
Ball	Rubber
....	...

Discussion

Q: What kinds of matter are used to make objects? Wood, glass, rubber, plastic, metal, paper, etc

Q: Why is a glass used to make a window? Because the glass is transparent.

Q: Why is ball made from rubber? Because the rubber is elastic and bouncy.

Q: How do we choose matter when we make an object? We choose the best matter for the object based on its properties.

Summary

- An object is a thing that we can see or touch.
- A chair, stone, tree and water are examples of objects.
- A kind of matter that used to make an object is called a material.
- Wood, glass, rubber and plastic are examples of materials
- We use different kinds of materials to make different objects.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 16 / 94
Matter	Topic : **2.1. Describing Matter**	Textbook page: 43 - 44

Lesson
7 / 17

Lesson Title

Summary and Exercise

Tips of lesson

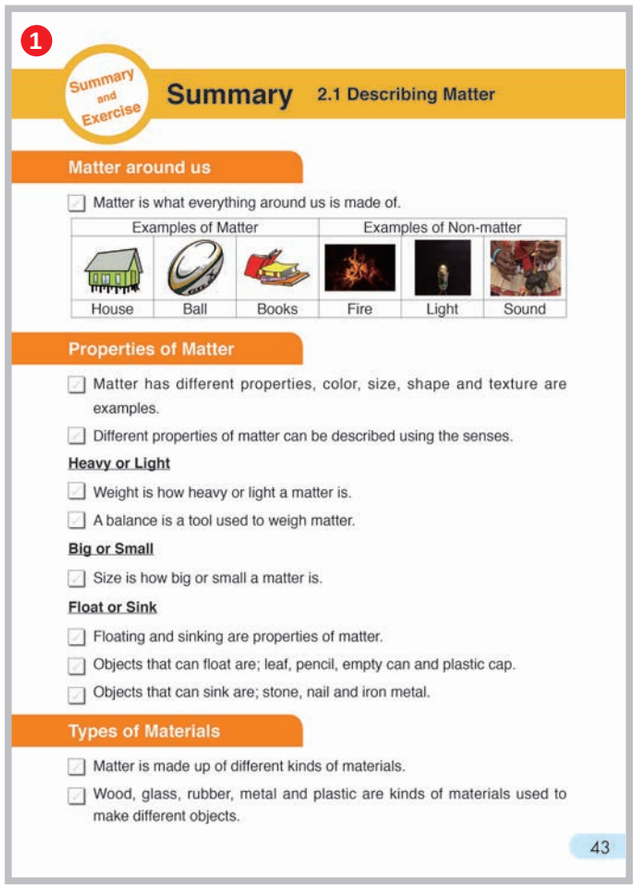
1 Summary (20 min.)

- Begin by asking the students with a question;

Q:Can someone guess what key word is learned in all the lessons so far? (Matter)

- Explain to students that in all our lessons covered we have discovered what matter is and are able to describe matter by their properties.
- Recap the main learning contents with the students.
- Based on the main learning contents, ask students some questions and verify their understanding with the summary points. For example:

Q:What are some properties of matter you have learned throughout the lessons? (Weight, size, float, sink, shape, colour etc.)



1

Summary and Exercise

Summary 2.1 Describing Matter

Matter around us

- Matter is what everything around us is made of.

Examples of Matter			Examples of Non-matter		
House	Ball	Books	Fire	Light	Sound

Properties of Matter

- Matter has different properties, color, size, shape and texture are examples.
- Different properties of matter can be described using the senses.

Heavy or Light

- Weight is how heavy or light a matter is.
- A balance is a tool used to weigh matter.

Big or Small

- Size is how big or small a matter is.

Float or Sink

- Floating and sinking are properties of matter.
- Objects that can float are; leaf, pencil, empty can and plastic cap.
- Objects that can sink are; stone, nail and iron metal.

Types of Materials

- Matter is made up of different kinds of materials.
- Wood, glass, rubber, metal and plastic are kinds of materials used to make different objects.

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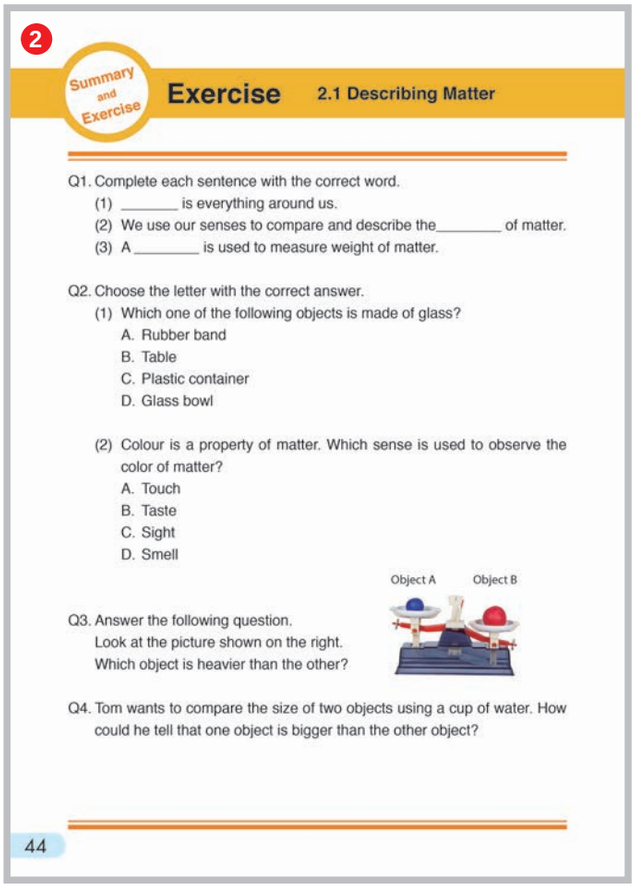
2 Exercise & Explanation (30 min.)

- Go through with students the instructions of the exercise.
- Provide enough time for students to attend to the questions in response to their understanding
- After the exercise, give them the answers to the questions and explain how to solve them using their scientific knowledge.
- After the exercise, provide the answers of the questions to students and explain to justify the answers along with students' answers.



2

Summary and Exercise

Exercise 2.1 Describing Matter

Q1. Complete each sentence with the correct word.
(1) _____ is everything around us.
(2) We use our senses to compare and describe the_____ of matter.
(3) A _____ is used to measure weight of matter.

Q2. Choose the letter with the correct answer.
(1) Which one of the following objects is made of glass?
A. Rubber band
B. Table
C. Plastic container
D. Glass bowl

(2) Colour is a property of matter. Which sense is used to observe the color of matter?
A. Touch
B. Taste
C. Sight
D. Smell

Q3. Answer the following question.
Look at the picture shown on the right.
Which object is heavier than the other?

Object A Object B

Q4. Tom wants to compare the size of two objects using a cup of water. How could he tell that one object is bigger than the other object?

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Exercise answers

Q1.

(1) **Matter**

Student might give the answer as environment. Environment is everything that makes up our surroundings and those things are referred to as matter.

(2) **Properties**

It is through the senses that we are able to describe the size, shape, colour, smell, weight and taste of matter.

(3) **Balance**

Q2.

(1) **D**

(2) **C**

Five senses	Types of Properties
Sight	Shape, size, colour
Touch	Texture, hardness, smoothness
Smell	Smell, odour
Hearing	Sound
Taste	Sweet, sour

Q3. **Object B**

When the two objects were placed on the balance, the balance tilt towards the heavier side.

Q4. Example of the answer

By placing the objects at a time into the cup of water and observing the increase of the size of water in the cup.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 17 / 94
Matter	Topic : **2.2. Measuring Matter**	Textbook page: 45 - 46

Lesson 8 / 17

Lesson Title

Taking up Space (Volume)

Preparation

- Cups, Pebbles, Water

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson on 'Properties of Matter' Topic 2.1 by asking:

Q:How can we describe matter?

Q:Give some examples of the properties of matter.

- Motivate students to think about the common property of matter by asking:

Q:Matter has different properties, but does matter have a common property?

2 Introduce the key question

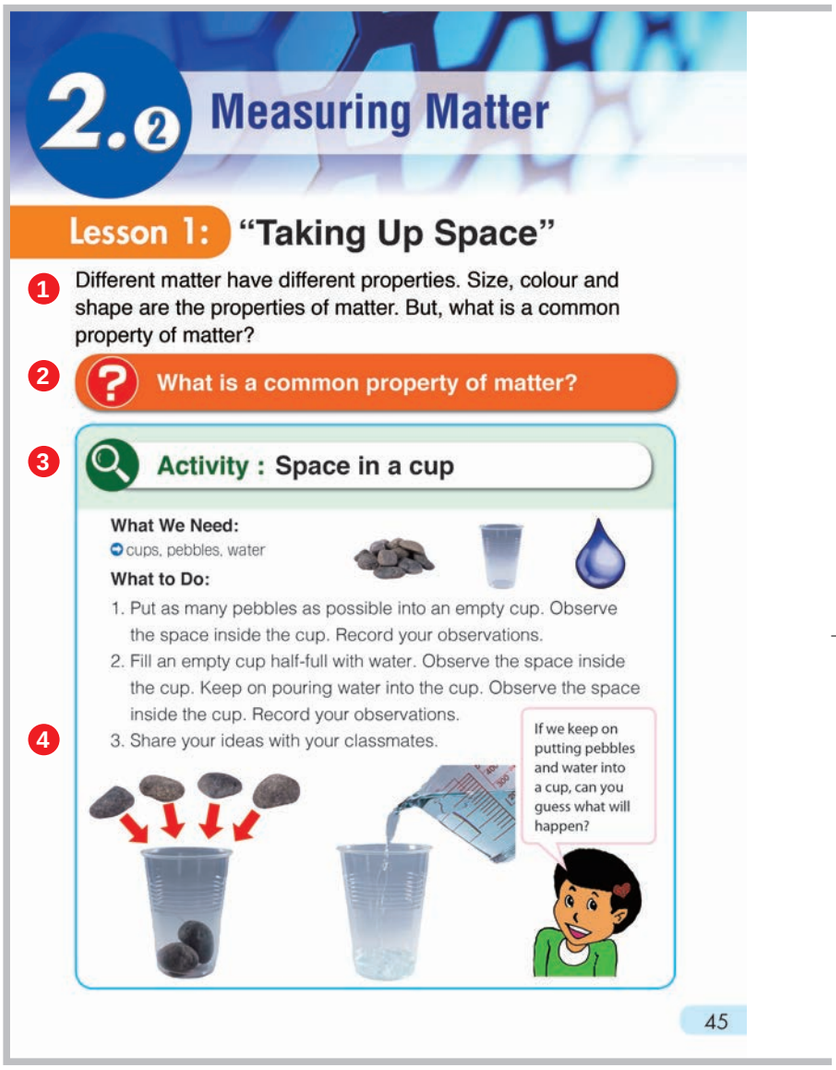
What is a common property of matter?

3 Activity (20 min.)

- Organise students into groups.
- Explain the steps of of the activity
- Have students do the investigation.
- Ask them to record their observations in their exercise book.
- Check students' activity in each group. If necessary, facilitate their investigation.

4 Discussion for findings (25 min.)

- Ask students to present their results from their activity.
- Write down students' findings on the blackboard. (Continue)



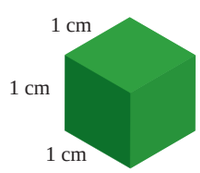
Teacher's Notes

- As described before, a matter or an object physically exists. It occupies the space. Two objects cannot occupy the same space at the same time. An object must move before another object can occupy that space.
- The amount or capacity of space that an object or shape occupies is called a volume. It is the three-dimensional quantity often measured in cubic meter (m^3) or cubic centi-meter (cm^3). The superscript '3' in the unit means three-dimension which is a multiplication of distance times distance times distance, i.e. 'm x m x m' or 'cm x cm x cm'. For example, volume of cuboid is calculated length times width times height.
- Litre (L) is often used as a unit of volume particularly for liquid, too. One litre is the volume of a 10-centimetre cube, thus

  1 litre(L) = 1000 cubic centi-metres(cm^3) = 0.001 cubic metres(m^3)

  1 cubic metre(cm^3) = 1000 litres(L).
- Millilitre (mL) is also used for measuring small amounts of liquid;

  1 millilitre(mL) = 0.001 litres(L) = 1 cubic centimetre(cm^3).



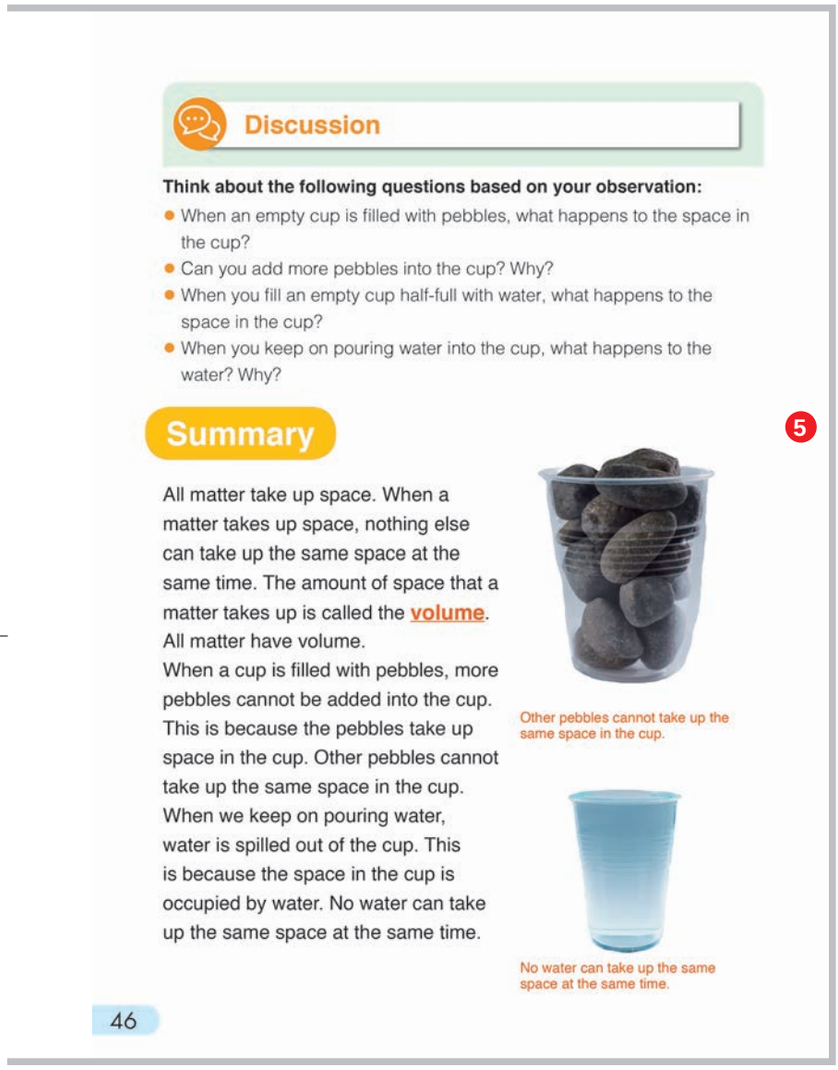
= 1 cubic centimetre (cm^3)

Lesson Objectives

Students are able to:
- Define what volume is.
- Describe the common property of matter. (Matter takes up space.)
- Demonstrate how matter takes up space.

Assessment

Students are able to:
- Explain the meaning of volume.
- Find the common property of matter ('Matter takes up space') based on the results of the activity through discussion.
- Actively participate in group work..



Discussion

Think about the following questions based on your observation:

- When an empty cup is filled with pebbles, what happens to the space in the cup?
- Can you add more pebbles into the cup? Why?
- When you fill an empty cup half-full with water, what happens to the space in the cup?
- When you keep on pouring water into the cup, what happens to the water? Why?

Summary

All matter take up space. When a matter takes up space, nothing else can take up the same space at the same time. The amount of space that a matter takes up is called the **volume**. All matter have volume.
When a cup is filled with pebbles, more pebbles cannot be added into the cup. This is because the pebbles take up space in the cup. Other pebbles cannot take up the same space in the cup. When we keep on pouring water, water is spilled out of the cup. This is because the space in the cup is occupied by water. No water can take up the same space at the same time.

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- **Based on their findings,** ask these questions.

Q:What happened to the space in the cup when it was filled with the pebbles and half-full with water? (They took up the space in the cup.)

Q:Can you add more pebbles into the cup? No, Why? (Because the space had already been taken up and nothing else could take up the same space at the same time.)

Q:What happened when you kept pouring water into the cup? The water spilled out of the cup. Why? (Because the space in the cup was already occupied by water.)

- Conclude the discussion

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise the day's lesson on the blackboard.
- Ask these questions as assessment:
  Q:What is volume?
  Q:What common property does matter have?
  Q:Why does water spill out of a cup when we keep pouring water?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Taking Up Space"

Key question
What is a common property of matter?

Activity
Space in a Cup

1.Putting pebbles in a cup
Observation: When the cup was filled with pebbles they took up the space in the cup.

2. Filling cup with water
Observation: When the water was filled half-full with water, it took up the space in the cup.

Discussion
Q: What happened to the space in the cup when it was filled with the pebbles and half- full with water?
They took up the space in the cup.

Q: Can you add more pebbles into the cup? No, Why?
Because the space had already been taken up and nothing else could take up the same space at the same time.

Q: What happened when you kept pouring water into the cup? The water spilled out of the cup. Why? Because the space in the cup was already occupied by water.

Summary
- Matter takes up space.
- The amount of space it takes up is called the volume.
- Volume is a common property in all matter.
- When matter takes up space, nothing else can take up the same space at the same time

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 18 / 94
Matter	Topic : **2.2. Measuring Matter**	Textbook page: 47 - 48

Lesson 9 / 17

Lesson Title

Measuring Volume of Water

Preparation

- Measuring cup
- Water
- Drinking Cup, small bowl,

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson by asking:

Q:What is a common property of matter?

Q:What is the meaning of volume?

- Motivate students to think about measuring the volume of water by asking:

Q:Matter has its volume. Water also has its volume, but how can we measure the volume of water?

2 Introduce the key question

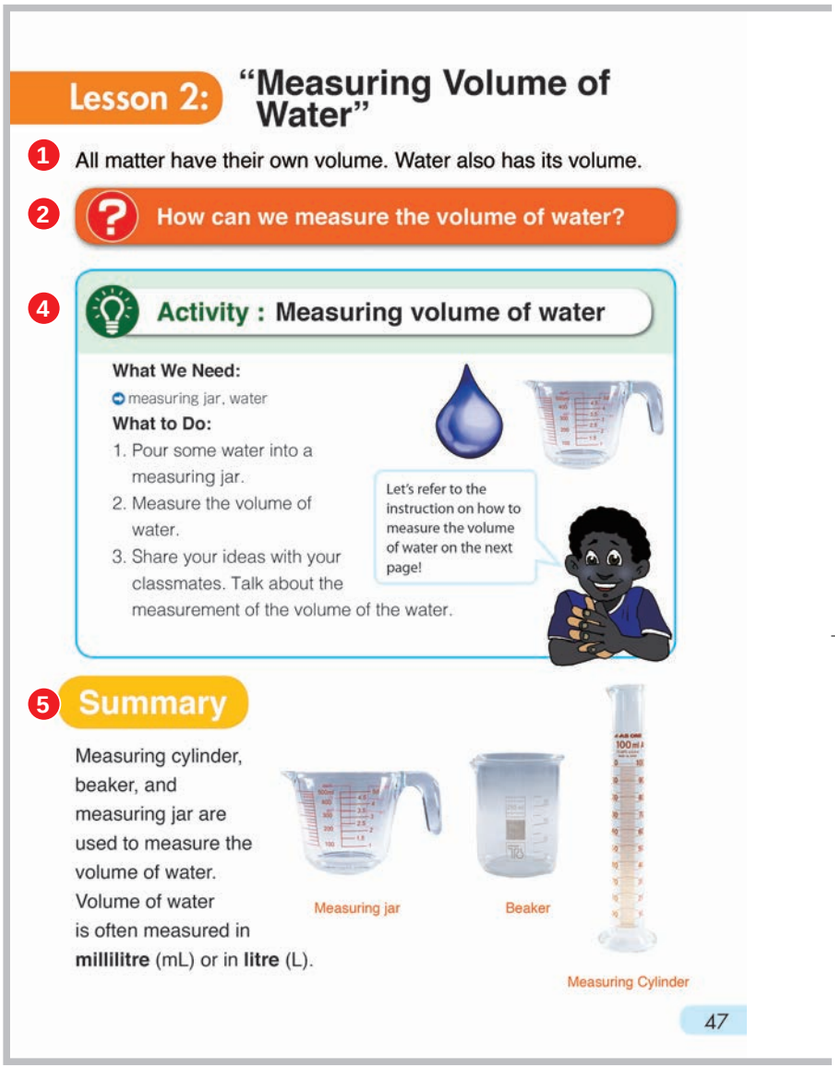
How can we measure the volume of water?

3 Science Toolbox (20 min.)

- Ask students to open their textbook and to read through 'Science Toolbox'.
- Explain 'Measuring Volume of Water' step by step.
- Note: The most important points for measuring the volume of water is that:
  - Position eyes at the level with the top of the water.
  - Look at the lowest point of the curved water surface.

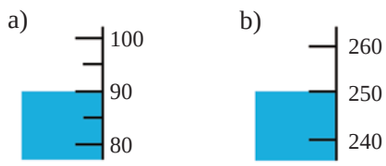
4 Activity (25 min.)

- Organise students into some groups.
- Explain the steps of the activity. (Continue)



Teacher's Notes

- Measuring cylinders and beakers are pieces of laboratory ware and measuring cups is generally a piece of kitchen ware. Measuring cylinders are specially designed to measure the accurate volume of an object or amount of liquid, whereas beakers are often used for stirring, mixing and heating liquids rather than for measuring the volume.
- The top curve surface of the liquid in measuring apparatus is called 'meniscus'. Take your measurement at the centre point of the meniscus (curve).
- Scales labelled on those measuring apparatuses are used to find out the volume of an object or amount of liquid. Scales are like number lines. It is read up from the bottom and goes upwards. They have numerous different scales. To determine the volume, you must know the scale interval of the apparatus you use before the measurement. These intervals are usually 1, 2, 5 or 10.



Item	a	b
Interval	5ml	10ml
Reading	90ml	250ml

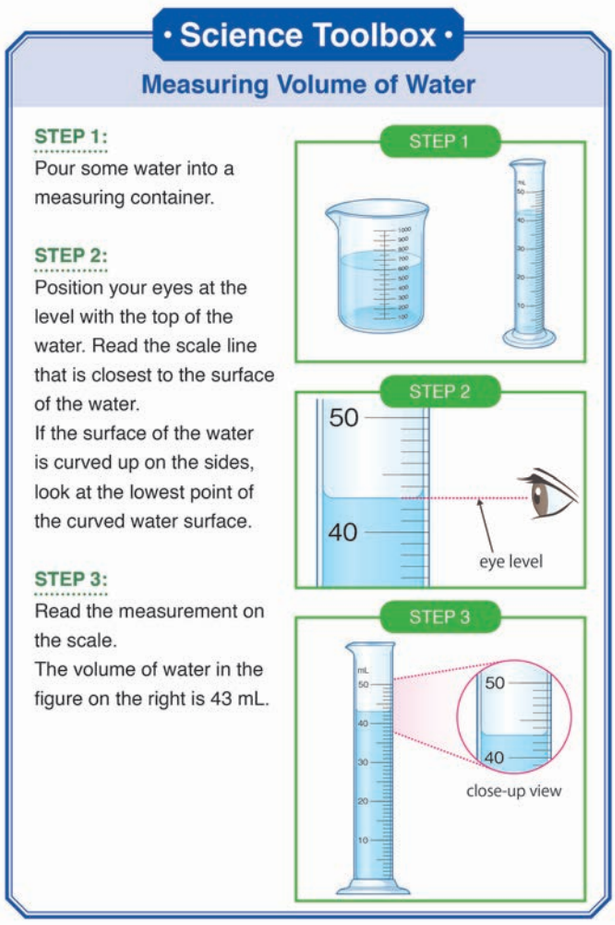
Lesson Objectives

Students will be able to:
- Explain how to measure the volume of water.
- Measure the volume of water using different equipment.

Assessment

Students are able to:
- State the measuring tools to measure the volume of water.
- Record the volume of water using an appropriate unit.
- Listen to opinions from classmates with respect.

3



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- Have students carry out the investigation.
- Guide students during the activity to consider accuracy as important when reading the volume of water.
- After measuring the volume of water, ask students to present their result from their activity.
- Write down students' answer on the blackboard.
- Confirm the findings with students.
- **Based on their results,** ask these following questions:

Q:What are the important things to do when reading the volume of water? (Position the eyes correctly at the level with the top of the water. Look at the lowest point of the curved water surface.)

Q:What kinds of unit for the volume of water or any liquid have you ever seen? (L, mL, etc)

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise the day's lesson on the black board.
- Ask these questions as assessment:
  Q:How can we measure the volume of water?
  Q:What tools and unit is used in measuring the volume of water?
  Q:What are the important things used when we read the volume of water?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Measuring Volume of water"

Key question
Q: How can we measure the volume of water?

Activity
Measuring the volume of water

The volume of water (in millilitres)
43 millilitres (Example)

Discussion
Q: What are the important things to do when reading the volume of water?
- Position the eyes correctly at the level with the top of the water.
- Look at the lowest point of the curved water surface.

Q: What kinds of unit for the volume of water or any liquid have you ever seen?
L, mL, etc

Summary
- Volume of water can be measured using
  - Measuring cylinder,
  - beaker
  - Measuring cup.
- A unit used for measuring volume of water is:
  - Millilitres (mL)
  - Litres (L)

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 19 / 94
Matter	Topic : **2.2. Measuring Matter**	Textbook page: 49 - 50

Lesson 10 / 17

Lesson Title

Measuring Volume of Stone

Preparation

- A stone, measuring container
- Water, piece of string

Lesson Flow

1 Introduction (10 min.)

- Revise previous lesson on 'Measuring Volume of Water' and 'Big or Small' by asking:

Q:What do we use to measure the volume of water?

Q:What happened to the water lines when we placed a stone into the glass?

- Encourage students to think about measuring the volume of stone by asking:

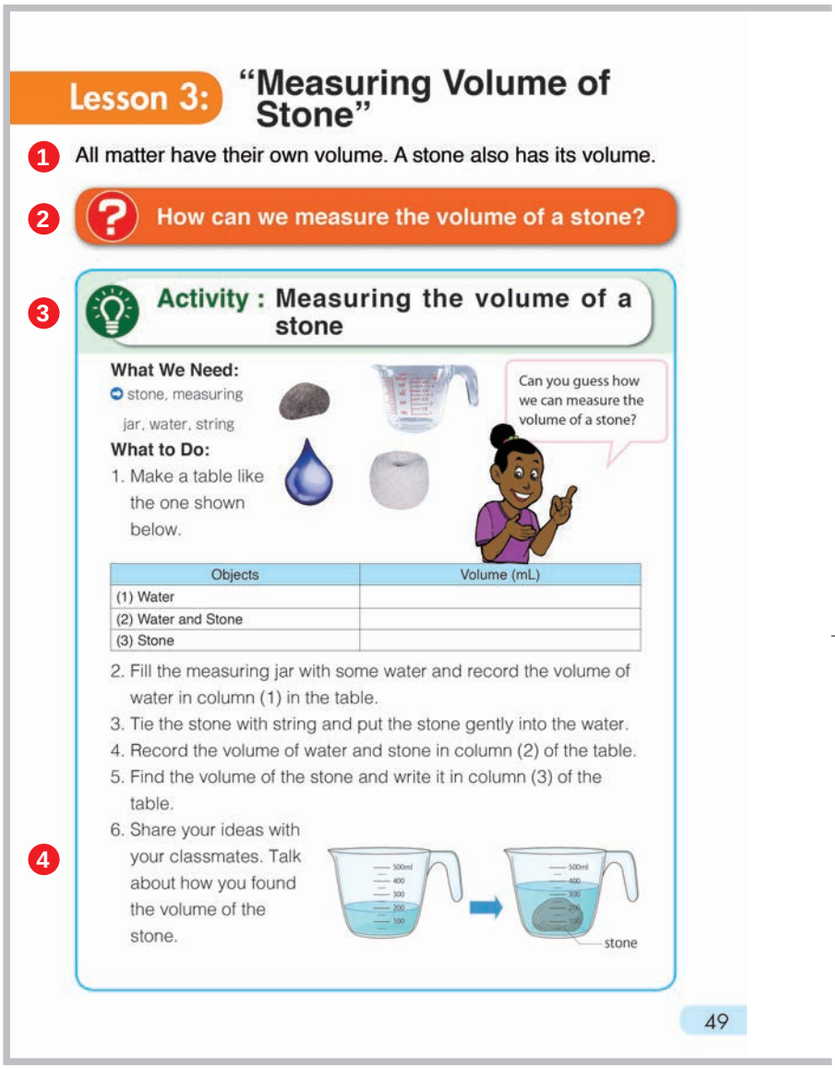
Q:We can measure the volume of water by using a measuring cylinder, but how can we measure the volume of a stone?

2 Introduce the key question

How can we measure the volume of a stone?

3 Activity (25 min.)

- Organise students into some groups.
- Explain the steps of the activity.
- Help students to tie a stone with a string.
- Have students to do the activity and ask them to record their results in the table.
- Advise them to put the stone gently into the water.
- Provide enough time for students to find out their findings.
- Ask students to discuss their findings.



Lesson 3: "Measuring Volume of Stone"

1 All matter have their own volume. A stone also has its volume.

2 How can we measure the volume of a stone?

3 Activity : Measuring the volume of a stone

What We Need:
stone, measuring jar, water, string

What to Do:
1. Make a table like the one shown below.

Can you guess how we can measure the volume of a stone?

Objects	Volume (mL)
(1) Water	
(2) Water and Stone	
(3) Stone	

2. Fill the measuring jar with some water and record the volume of water in column (1) in the table.
3. Tie the stone with string and put the stone gently into the water.
4. Record the volume of water and stone in column (2) of the table.
5. Find the volume of the stone and write it in column (3) of the table.
6. Share your ideas with your classmates. Talk about how you found the volume of the stone.

4

stone

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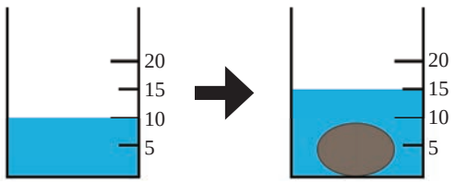
Teacher's Notes

- Refer to the 'Teacher's Note' on page 50 to see more details about the unit 'cubic centimetre (cm^3)'
- Make sure the initial volume of water in the measuring apparatus is recorded. If the volume of the water is insufficient and the object (stone) cannot perfectly sink, you are unable to get accurate reading.
- Be careful when immersing (sinking) the stone into the measuring apparatus made of glass. Tie the stone firmly with the piece of string so it does not fall off.
- Remember to use a piece of cloth or tissue to rub off spills of water to prevent the equipment falling off.



- If it is difficult to arrange the activity or you need extra exercise, draw the diagram on the left on the blackboard.

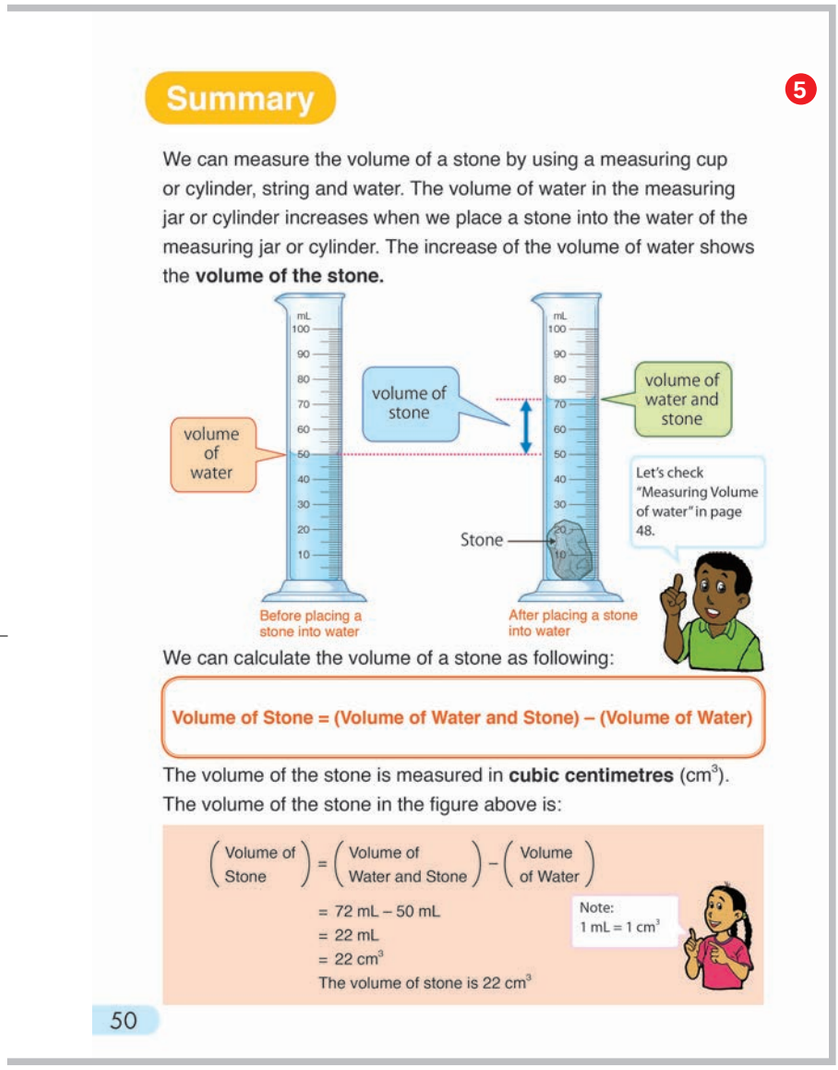
Water (initial)	10 mL
Water & stone	15 mL
Stone	5 cm^3 (= 5 mL)

Lesson Objectives

Students will be able to:
- Measure the volume of an irregular shape of an object.
- Explain how to measure the volume of an irregular shape of an object.

Assessment

Students are able to:
- Calculate the volume of the stone using the given formula.
- Record the volume of water and stone using an appropriate unit.
- Listen to opinions from classmates with respect.



4 Discussion for findings (20 min.)

- Ask each group to present their results from their activity.
- Write their results on the black board.
- Confirm the results with students
- **Based on their findings,** ask the following questions.

Q:What happened to the water lines when we placed a stone into the glass? (The level of water rose)

Q:What is the increase of the amount of water equal to? (It is equal to the volume of the stone)

- Explain how to calculate the volume of a stone and how to change the unit of volume.
- Have students to calculate the volume of a stone in groups ('Calculate the volume of a stone!').
- Ask each group to present their answers and conclude the discussion.

5 Summary (5 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise the day's lesson on the blackboard.
- Ask these questions as assessment:
  Q:How can we measure the volume of a stone?
  Q:What unit is used in measuring the volume of a stone?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"Measuring volume of stone"

Key question

How can we measure the volume of a stone?

Activity

Measuring the volume of a stone

Objects	Volume (mL)
Water	e.g. 72 mL
Water and stone	e.g. 50 mL
Stone	e.g. 22 cm³

(Given as sample answers only)

Discussion

Q: What happened to the water lines when we place a stone into a glass?

The level of water rose.

Q: What is the increase of the amount of water equal to?

It is equal to the volume of the stone.

Calculate the volume of a stone!

Volume of stone =
(Volume of Water and Stone) –
(Volume of Water)

Summary

- Stone is a matter and takes up space or has volume.
- Volume of stone is measured in cubic centimetre (cm³)
- When a stone takes up space of water in a container, the increase of the volume of water is equal to the volume of a stone.
- We can measure the volume of a stone as:
  (Volume of Stone) =
  (Volume of water and stone) –
  (Volume of Water)

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 20 / 94
Matter	Topic : **2.2. Measuring Matter**	Textbook page: 51 - 52

Lesson 11 / 17

Lesson Title

Weight and Shape of Matter

Preparation

- A balance
- Two clods of clay with equal weight

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson.

Q:Does a stone have volume?

Q:How can we measure the volume of a stone?

- Motivate students to think about the relationship between the weight and shape of matter by asking:

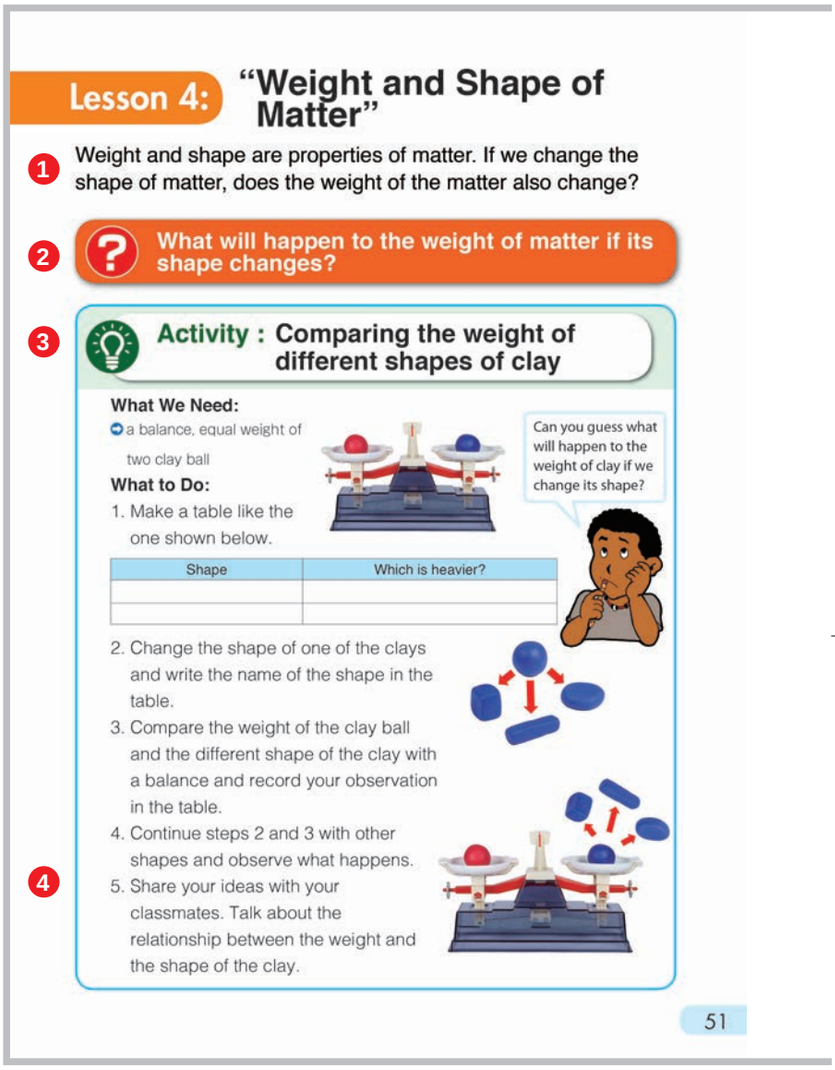
Q:Weight and shape are properties of matter. Does the weight of the matter change if we change the shape of the matter?

2 Introduce the key question

What will happen to the weight of matter if its shape changes?

3 Activity (20 min.)

- Review how to use a balance. (Refer to 'Science Toolbox: how to use a balance' in the textbook)
- Organise students into some groups..
- Explain the steps of the activity.
- Ask students to draw the table in their exercise book.
- Let students predict what happen to the weight of clay if we change its shape and record their predictions.
- Have students do the activity and ask them to record their results in the table.
- Advise students to keep the shape of one ball and change the shape of another.
- Ask students to discuss their results in their groups.



Lesson 4: "Weight and Shape of Matter"

1 Weight and shape are properties of matter. If we change the shape of matter, does the weight of the matter also change?

2 What will happen to the weight of matter if its shape changes?

3 Activity : Comparing the weight of different shapes of clay

What We Need:

a balance, equal weight of two clay ball

What to Do:

1. Make a table like the one shown below.

Shape	Which is heavier?

Can you guess what will happen to the weight of clay if we change its shape?

2. Change the shape of one of the clays and write the name of the shape in the table.
3. Compare the weight of the clay ball and the different shape of the clay with a balance and record your observation in the table.
4. Continue steps 2 and 3 with other shapes and observe what happens.
5. Share your ideas with your classmates. Talk about the relationship between the weight and the shape of the clay.

4

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Teacher's Notes

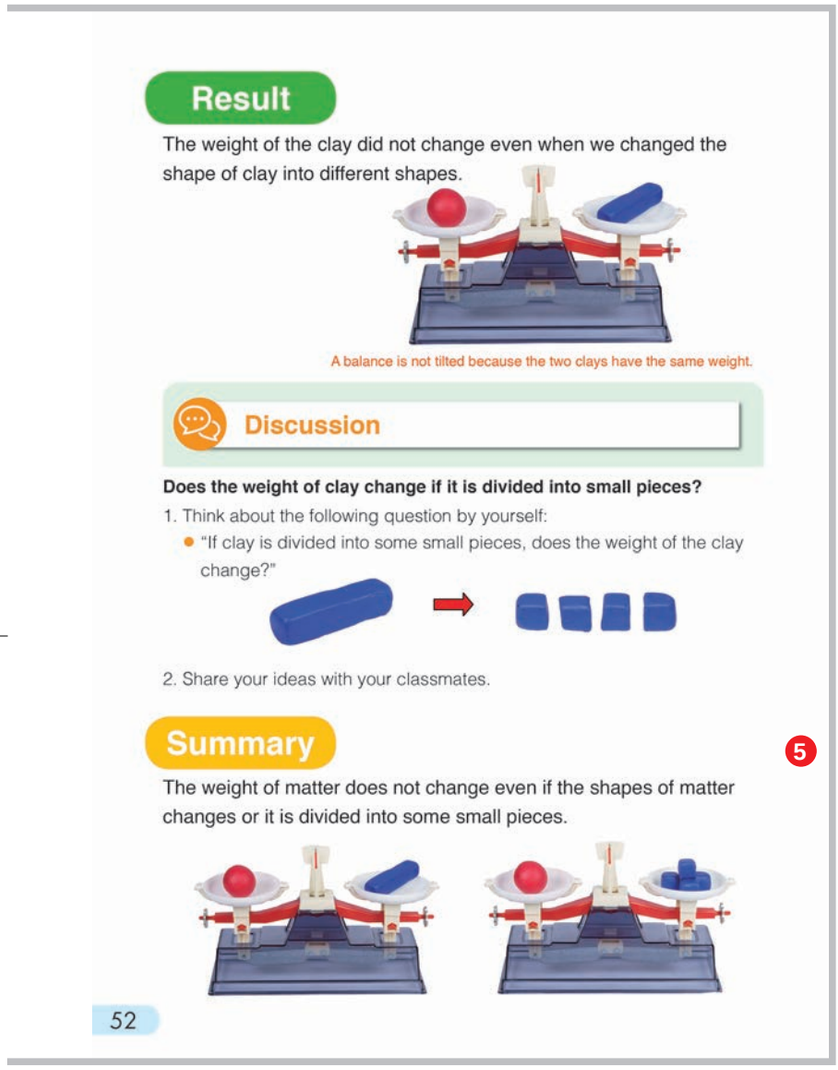
- Some students believe that a weight of an object changes if its shape changes. This kind of typical misunderstanding is called 'a scientific misconception' in science education. It is a bias or a preconceived notion which doesn't depend on actual scientific fact.
- Teachers must check which students have such misconception before the activity by asking their prediction.
- Some students also believe that a weight of an object changes if the object is turned (i.e. upside down) on the balance. You may ask students to do it as an extra activity if you have enough time in this lesson.
- Prior to the lesson, teacher should prepare sets of clay balls which are the relevant size to be balanced (not too small and not too big) so that students are engaged in the activity.
- To compare the weight of different shapes of clay, keep one of the original clay balls to 'control' the fair experiment. Only the shape of the other clay ball can be changed. They are scientifically called 'variable'. In the picture on the textbook for this activity, the clay ball on the left is refered to as 'control', and the clay ball on the right side is dealed as 'variable'.

Lesson Objectives

Students will be able to:
- Find the relationship between the weight of matter and the changes in its shape.
- Compare the weight of the different shapes of matters using a balance.

Assessment

Students are able to:
- Explain that weight of matter does not change even though the clay changes in shape or is divided into small pieces.
- Record their observation on the weight and shape of matter in the table.
- Express students' own opinion during discussion.



Result

The weight of the clay did not change even when we changed the shape of clay into different shapes.

A balance is not tilted because the two clays have the same weight.

Discussion

Does the weight of clay change if it is divided into small pieces?

1. Think about the following question by yourself:
   - "If clay is divided into some small pieces, does the weight of the clay change?"

2. Share your ideas with your classmates.

Summary

The weight of matter does not change even if the shapes of matter changes or it is divided into some small pieces.

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5

4 Discussion for findings (25 min.)

- Ask each group to present their results from the activity.
- Write their results on the blackboard.
- **Based on their finding,** ask the following questions.

Q:What happened to the weight of the clay when its shape was changed? (The weight of the clay did not change when it was changed into different shapes.)

- Encourage students to think more by asking:

Q:What if we divide the clay into smaller pieces?

- Have students discuss the question above in groups.
- Teacher can also demonstrate.
- Ask each group to present their answers and confirm their answers. (The weight of the clay would still remain the same.)
- Conclude the discussion

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise the day's lesson on the blackboard
- Ask these questions as assessment:
  Q:What happens to the weight of matter if its shape is changed?
  Q:What happens to the weight of matter if it is divided into small pieces?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"Weight and Shape of Matter"

Key question

What will happen to the weight of matter if its shape changes?

Activity

Comparing weight of different shapes of clay

Shape	Which is heavier?
A & B	Both wegith are the same.
A & C	Both wegith are the same.
A & D	Both wegith are the same.

Discussion

Q: What happened to the weight of the clay when its shape was changed?

The weight of the clay did not changed when it was changed into different shapes

Q: What if we divide the clay into smaller pieces?

The weight of the clay would still remain the same.

Summary

- Matter has shape and weight which are its properties.
- The weight of matter does not change even though matter changes its shape or it is divided into small pieces.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 21 / 94
Matter	Topic : **2.2. Measuring Matter**	Textbook page: 53 - 54

Lesson 12 / 17

Lesson Title

Weight and Volume of Matter

Preparation

- A balance
- Three empty plastic bottles (500ml)
- Water, sand

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson:

Q: What happens to the weight of matter if its shape is changed or divided into small pieces?

- Arouse students to think about the relationship between weight and volume of matter by asking:

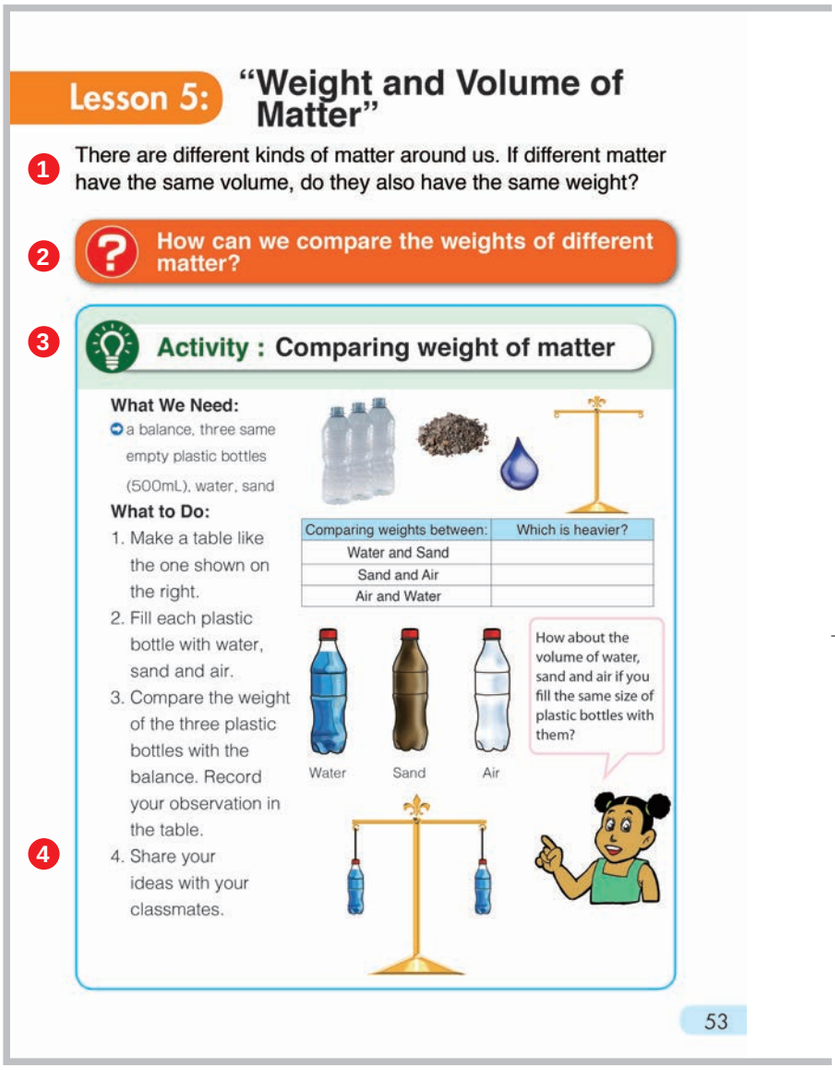
Q: Weight and volume is the properties of matter. Do different matter have the same volume if they have the same weight?

2 Introduce the key question

How can we compare the weights of different matter?

3 Activity (30 min.)

- Organise students into some groups.
- Explain the steps of the activity.
- Ask students to draw the table into their exercise books.
- Demonstrate and explain how to use a balance.
- Ask students to guess which matter is heavier or lighter and to record their predictions in their exercise book.
- Have students do the activity based on their predictions and record their results in the table.
- Ask students to discuss which matter is the heaviest or lightest based on their findings in their groups.



Lesson 5: "Weight and Volume of Matter"

1 There are different kinds of matter around us. If different matter have the same volume, do they also have the same weight?

2 How can we compare the weights of different matter?

3 Activity : Comparing weight of matter

What We Need:
a balance, three same empty plastic bottles (500mL), water, sand

What to Do:
1. Make a table like the one shown on the right.
2. Fill each plastic bottle with water, sand and air.
3. Compare the weight of the three plastic bottles with the balance. Record your observation in the table.
4. Share your ideas with your classmates.

Comparing weights between:	Which is heavier?
Water and Sand	
Sand and Air	
Air and Water	

Water Sand Air

How about the volume of water, sand and air if you fill the same size of plastic bottles with them?

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Teacher's Notes

- Weight is one of the major properties of matter. Each matter contains different amount of atoms/molecules. Each atom/molecule also has different weight. Therefore, weight varies by matters. Comparison of weight helps people to identify the matter.
- For fair comparison of the weight, we need to use the same shape and size of container to 'control' the volume so that students can fairly compare the weights of matters when they have the same volume. This experience of comparison will help students to understand the concept of density (mass per unit volume) in later study.
- For example, the result of this activity implies that the density of sand is bigger than that of water. Because sand is heavier than water if they have the same volume. It means sand sinks in water, as you experience in daily life. Conversely, the density of air is smaller than that of water and thus the air bubbles in water floats (moving upwards).

Lesson Objectives

Students will be able to:
- Describe how to compare the weight of the different matter.
- Compare the weight of the different kinds of matter.

Assessment

Students are able to:
- Explain that the same volume of different matter have different weight.
- Identify which matter is the heaviest or lightest among air, sand and water with the same volume.
- Show eagerness towards investigation.

Result

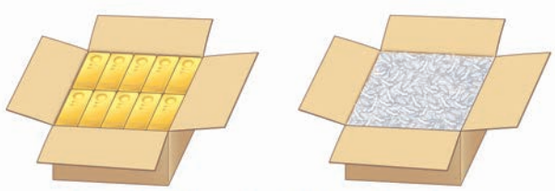
Water, sand and air have the same volume. Sand is heavier than water.
Sand is heavier than air.
Water is heavier than air. From these results, we found that the same volume of water, sand and air have different weights.

Comparing weights between:	Which is heavier?
Sand and Water	Sand
Sand and Air	Sand
Air and Water	Water

Comparing weight of sand and water | Comparing weight of sand and air | Comparing weight of air and water

Summary

Different kinds of matter with the same volume have different weights. For example, the two boxes below have the same volume. If we filled one with gold and another with feathers, the box filled with feathers would be much lighter because the feathers are not as compact as the gold. We can compare the weights of different matter if their volume is the same.



The gold would be heavier than the feathers in the same box.

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5

4 Discussion for findings (15 min.)

- Ask each group to present their results from the activity.
- Write down their results on the blackboard.
- Confirm the results with students.
- **Based on their result,** ask the following questions.

Q:Which material is the heaviest among air, water and sand? Why? (Sand is the heaviest because sand is heavier than air and water.)

Q:Which material is the lightest among air, water and sand? Why? (Air is the lightest, because air is lighter than air and water.)

Q:Is the volume of air, water and sand different or same? Why? (The volume is the same, because they are bottled in the same size of a plastic bottle.)

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard. (refer to Blackboard sample)
- Ask these questions as assessment:
  Q:Do different kinds of matter with the same volume have the same weight?
  Q:How can we compare the weight of different matters?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Weight and Volume of Matter"

Key question
How can we compare the weights of different matter?

Activity
Comparing weight of matter s

Comparing weights between:	Which is heavier?
Water and Sand	Sand
Sand and Air	Sand
Air and Water	Water

Discussion
Q: Which material is the heaviest among air, water and sand? Why?
Sand is the heaviest because sand is heavier than air and water.
Q: Which material is the lightest among air, water and sand? Why?
Air is the lightest, because air is lighter than sand and water.
Q: Is the volume of air, water and sand different or same? Why?
Their volume is the same, because they are bottled in the same size of a plastic bottle.

Summary
- Weights of different matters can be compared when they have the same volume.
- Different kinds of matter with the same volume have different weight.

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 22 / 94
Matter	Topic : **2.2 Measuring Matter**	Textbook page: 55 - 56

Lesson
13 / 17

Lesson Title

Summary and Exercise

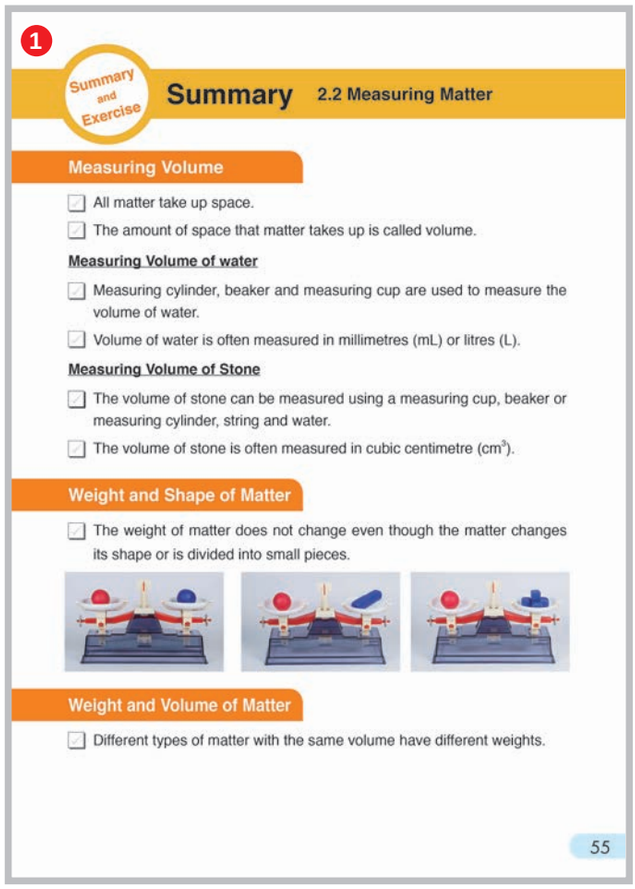
Tips of lesson

1 Summary (20 min.)

- Recap main learning contents to capture students' understanding on the Topic 'Measuring Matter'
- Based on the main learning contents, ask students some questions, For example:

Q:What are some properties of matter which can be measured? (Weight, volume,)

- Verify their understanding with the summary points.
- Allow students to read aloud the main ideas of the topic and then copy into their exercise books.



1

Summary and Exercise

Summary 2.2 Measuring Matter

Measuring Volume

- All matter take up space.
- The amount of space that matter takes up is called volume.

Measuring Volume of water

- Measuring cylinder, beaker and measuring cup are used to measure the volume of water.
- Volume of water is often measured in millimetres (mL) or litres (L).

Measuring Volume of Stone

- The volume of stone can be measured using a measuring cup, beaker or measuring cylinder, string and water.
- The volume of stone is often measured in cubic centimetre (cm^3).

Weight and Shape of Matter

- The weight of matter does not change even though the matter changes its shape or is divided into small pieces.

Weight and Volume of Matter

- Different types of matter with the same volume have different weights.

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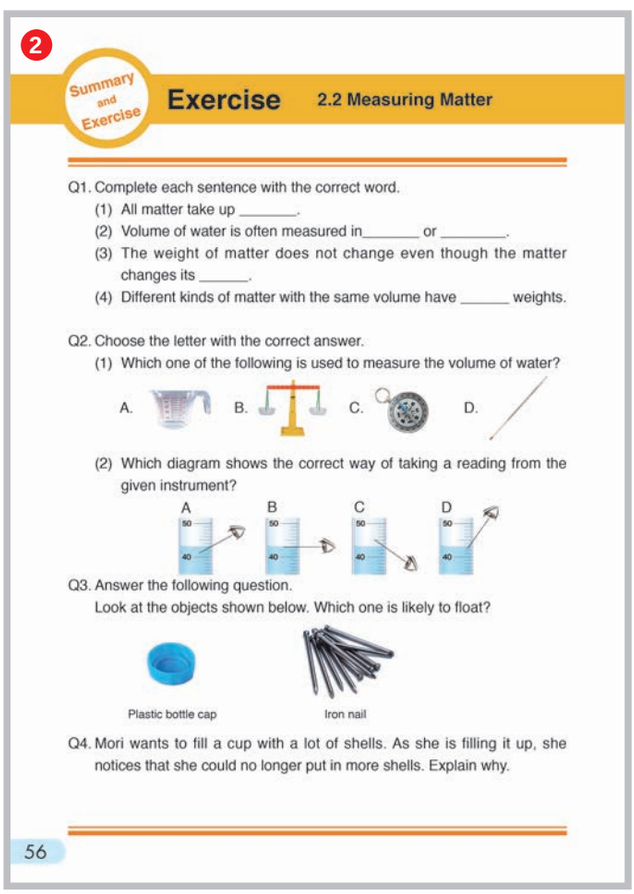
2 Exercise & Explanation (30 min.)

- Go through with students the instructions of the exercise.
- Provide enough time for students to attend to the questions in response to their understanding
- After the exercise, give them the answers to the questions and explain how to solve them using their scientific understanding and ideas.
- After the exercise, provide the answers of the questions to students and explain to justify the answers along with students' answers.



2

Summary and Exercise

Exercise 2.2 Measuring Matter

Q1. Complete each sentence with the correct word.
(1) All matter take up _____.
(2) Volume of water is often measured in_____ or _____.
(3) The weight of matter does not change even though the matter changes its _____.
(4) Different kinds of matter with the same volume have _____ weights.

Q2. Choose the letter with the correct answer.
(1) Which one of the following is used to measure the volume of water?
A. B. C. D.

(2) Which diagram shows the correct way of taking a reading from the given instrument?
A B C D

Q3. Answer the following question.
Look at the objects shown below. Which one is likely to float?

Plastic bottle cap Iron nail

Q4. Mori wants to fill a cup with a lot of shells. As she is filling it up, she notices that she could no longer put in more shells. Explain why.

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Exercise answers

Q1.
(1) **space**
(2) **millitres, litres**
(3) **Shape**
If matter is changed into different shapes, this does not affect the weight. The weight of matter still remained.
(4) **Different**

Q2.
(1) **A**
(2) **B**
When reading the volume of water from a measuring tool, your eyes have to be fixed on the level of the water to take an accurate reading on the scale.

Q3. **Plastic bottle cap**

Q4 Example of the answer
Because the amount of space in the cup is being taken up by the shells; therefore nothing else can take up the same space at the same time

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 23 / 94
Matter	Topic : **2.3. Mixing Matter**	Textbook page: 57 - 58

Lesson 14 / 17

Lesson Title

Observing a Mixture

Preparation

- Small stones, nails, paper clips
- Dry beans, bowl

Lesson Flow

1 Introduction (5 min.)

- Review the previous lessons on 'Properties of Matter', Topic 2.2:

Q:What kinds of property does matter have?.

- Encourage students to think about a mixture of matter by asking:

Q:Do the properties of different kinds of matter change when they are mixed together?.

2 Introduce the key question

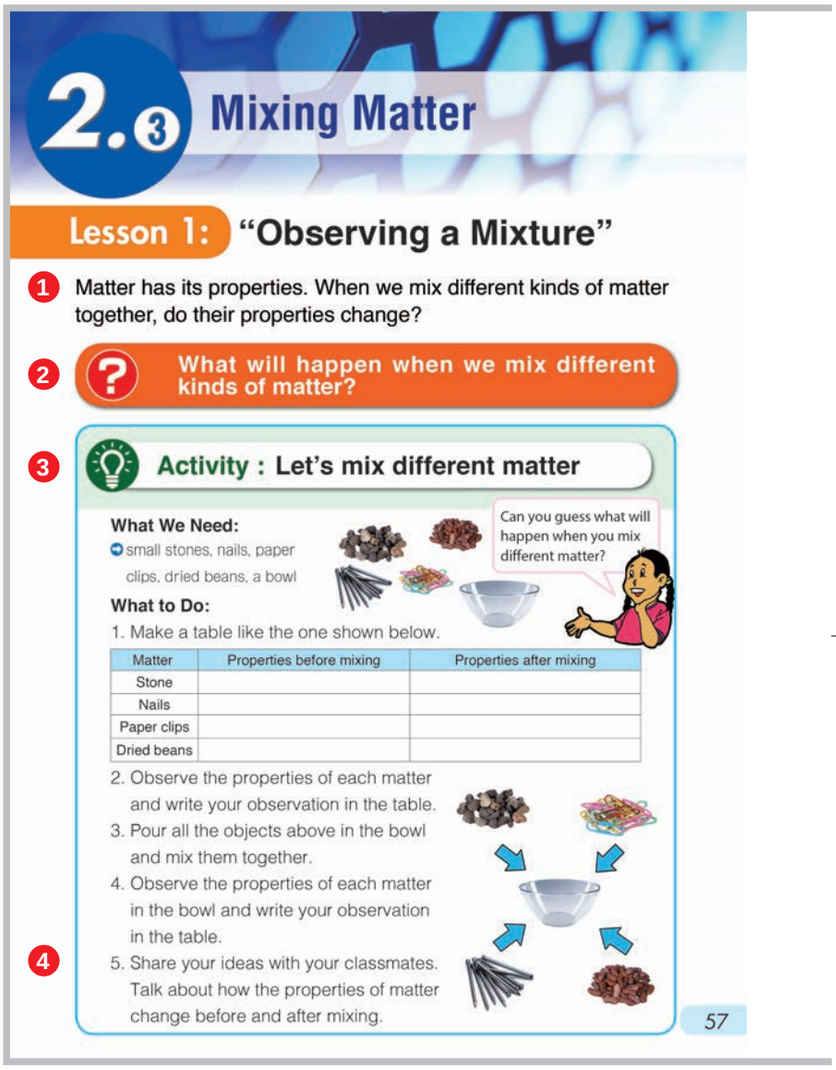
What will happen when we mix different kinds of matter?

3 Activity (20 min.)

- Organise students into some groups.
- Explain the steps of the activity.
- Ask students to draw the table into their exercise book.
- Advise students to pay more attention to the properties of each matter carefully before and after mixing.
- Have students to do the activity and ask them to record their observation in the table.
- Ask students to discuss how matter changed when it was mixed based on their findings in their group.

4 Discussion for findings (15 min.)

- Ask each group to present their findings from their activity. (Continue)



2.3 Mixing Matter

Lesson 1: "Observing a Mixture"

1 Matter has its properties. When we mix different kinds of matter together, do their properties change?

2 What will happen when we mix different kinds of matter?

3 Activity : Let's mix different matter

What We Need:
small stones, nails, paper clips, dried beans, a bowl

Can you guess what will happen when you mix different matter?

What to Do:

1. Make a table like the one shown below.

Matter	Properties before mixing	Properties after mixing
Stone		
Nails		
Paper clips		
Dried beans		

2. Observe the properties of each matter and write your observation in the table.
3. Pour all the objects above in the bowl and mix them together.
4. Observe the properties of each matter in the bowl and write your observation in the table.
5. Share your ideas with your classmates. Talk about how the properties of matter change before and after mixing.

4

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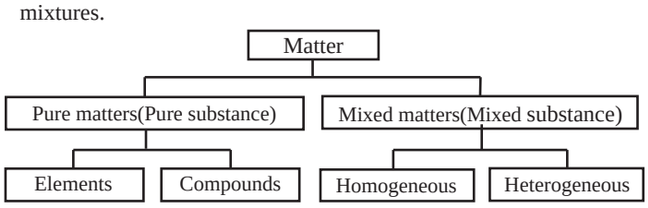
Teacher's Notes

- Matter is classified as below. Matter is divided into two categories such as 'Pure matter' and 'Mixed matter'.
- 'Pure matters' are further divided into 'Element' and 'Compound' and 'Mixed matters' are broken into 'Homogeneous' and 'Heterogenous' mixtures.



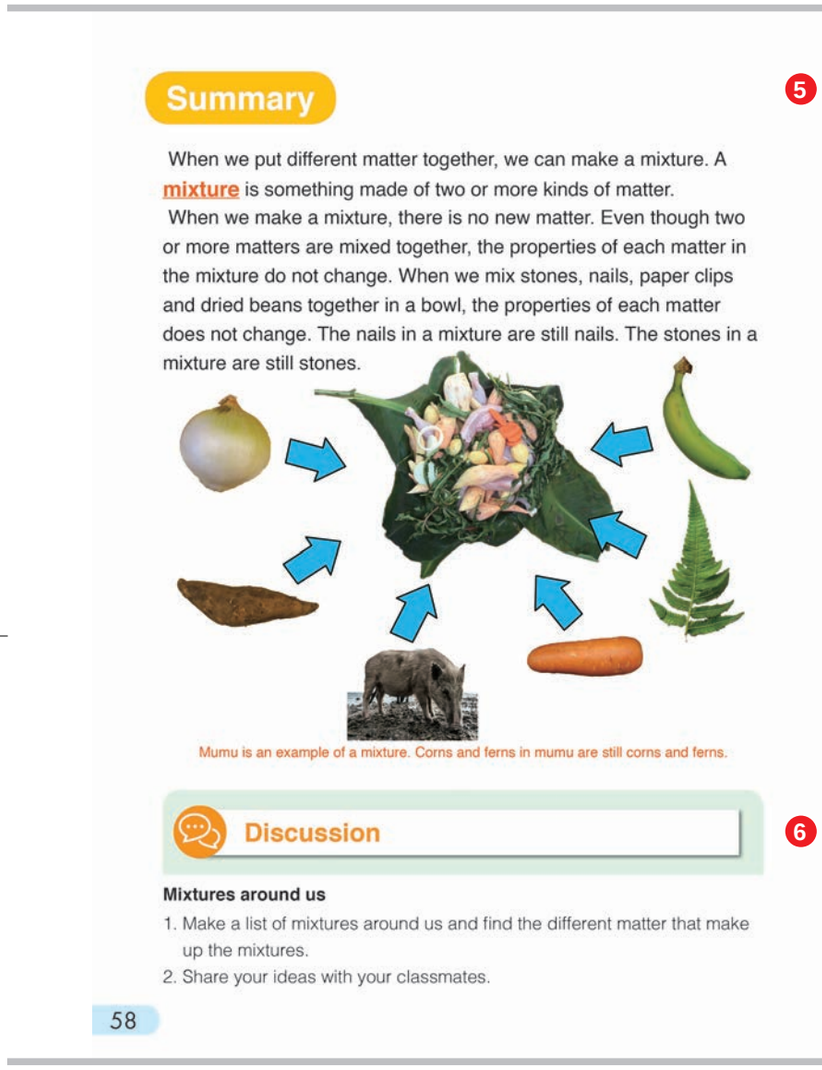
- Pure matters (often called 'pure substances') are composed of one type of atom or molecule and are again divided into 'elements' and 'compounds'.
- Elements contain only a single type of atom, whereas compounds are made up of two or more different types of atoms and molecules.
- Mixed matters (often called 'Mixed substance' or 'mixture') are composed of different kind of matters. Compounds are created when elements combine permanently, forming one substance like water (The chemical formula for water is H_2O, which consists of one oxygen atom chemically bonded to two hydrogen atoms). However, mixed matters are physically combined structures that can be separated into their original components. Thus, compounds are NOT mixed matters. Mixed matters are again divided into 'homogeneous' and 'heterogenous' matters. Please refer to the next teacher's note for further information

Lesson Objectives

Students will be able to:
- Define a mixture.
- Observe the properties of matter in a mixture.

Assessment

Students are able to:
- Explain how matter changes when it is mixed.
- Identify the properties of matter before and after it is mixed.
- Investigate a mixture with interest .



Summary

When we put different matter together, we can make a mixture. A **mixture** is something made of two or more kinds of matter. When we make a mixture, there is no new matter. Even though two or more matters are mixed together, the properties of each matter in the mixture do not change. When we mix stones, nails, paper clips and dried beans together in a bowl, the properties of each matter does not change. The nails in a mixture are still nails. The stones in a mixture are still stones.

Mumu is an example of a mixture. Corns and ferns in mumu are still corns and ferns.

Discussion

Mixtures around us

1. Make a list of mixtures around us and find the different matter that make up the mixtures.
2. Share your ideas with your classmates.

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- Write down students' findings on the blackboard.
- Confirm the findings with students.
- **Based on their observation results ,** ask these following questions.

Q:What kinds of properties did each matter have before mixing? (Colour, shape, size, texture, weight, etc.)

Q:What happened to the properties of each matter after mixing? (It did not change.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard.
- Ask students to copy the notes on the blackboard into their exercise books
- Ask these questions as assessment:
  Q:What is a mixture?
  Q:What happened to the properties of matter when different types of matter are mixed?
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion (10 min.)

- Have students make a list of mixtures around them.
- Ask students to present their ideas and write them on the blackboard.
- Confirm their ideas with students.
- Conclude the discussion.

Sample Blackboard Plan

Title:

"Observing a Mixture"

Key question What will happen when we mix different kinds of matter?

Activity Let's mix different matter

Matter	Properties before mixing	Properties after mixing
Stone	Gray, hard, round, etc.	Gray, hard, round, etc.
Nails	Silver, hard, sharp, etc.	Silver, hard, sharp, etc.
Paper clips	Blue or red, lighter, etc.	Blue or red, lighter, etc.
Dry beans	Round, smooth, etc.	Round, smooth, etc.

Discussion

Q: What kinds of properties did each matter have before mixing?

Colour, shape, size, texture, weight, etc

Q: What happened to the properties of each matter after mixing?

It did not change.

Summary

- Mixture is something made of two or more kinds of matter.
- When we make a mixture, there is no new matter.
- When one or more kinds of matter are mixed together, the properties of each matter do not change.

Further Discussion

Q: What are some mixtures that can be found around us?

A cup of tea, mixture of raw rice grains with bean seeds and green leaves, etc

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 24 / 94
Matter	Topic : **2.3. Mixing Matter**	Textbook page: 59 - 60

Lesson 15 / 17

Lesson Title

Separating a Mixture

Preparation

- Nails, sand, woods, a bowl, water, magnet, strainer

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson:

Q:What is a mixture?

Q:What happen to the properties of each matter when different matters are mixed together?

- Motivate students to think about how to separate a mixture by asking:

Q:After making a mixture, can we separate the mixture into each matter?

2 Introduce the key question

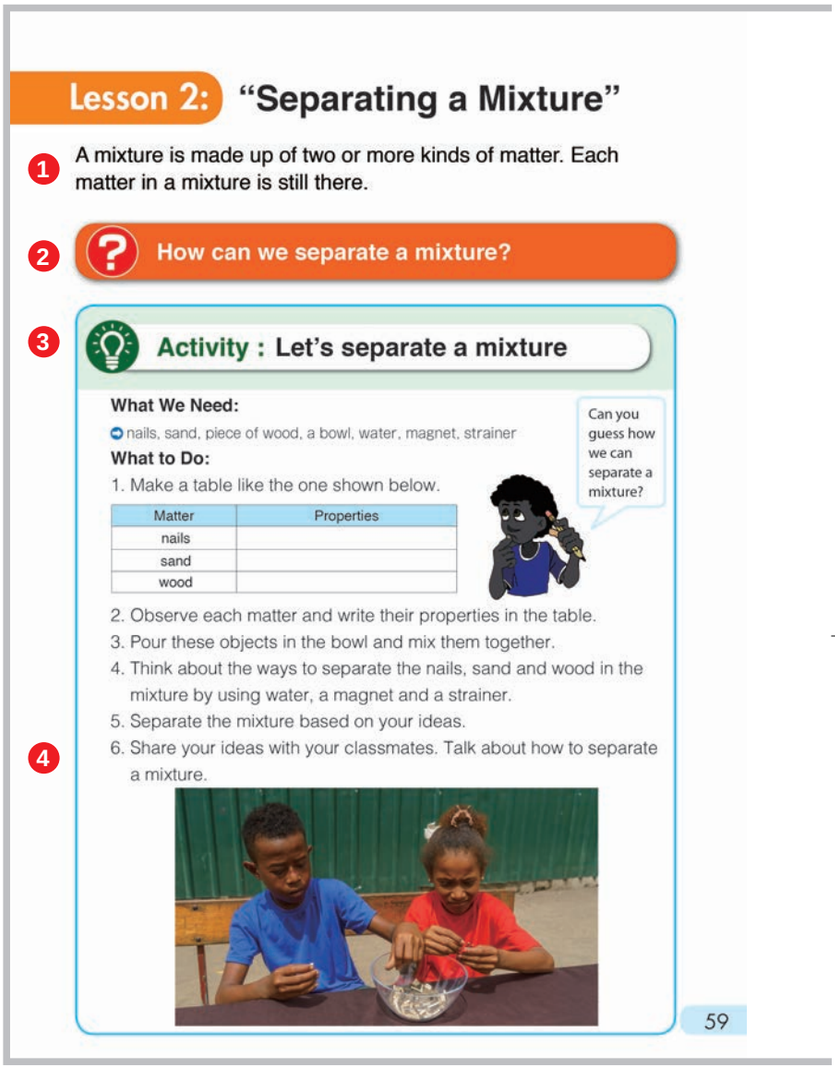
How can we separate a mixture?

3 Activity (20 min.)

- Organise students into some groups.
- Explain the steps of the activity
- Advise students to observe the properties of each matter and let them predict how to separate the mixture of nails, sand and woods.
- Have students do the activity based on their prediction and ask them to record their results in their exercise book.
- If necessary facilitate students' finding their answers.
- Ask students to discuss how a mixture can be separated based on their findings in their groups.

4 Discussion for findings (25 min.)

- Ask each group to present their findings from their activity. (Continue)



Lesson 2: "Separating a Mixture"

1 A mixture is made up of two or more kinds of matter. Each matter in a mixture is still there.

2 How can we separate a mixture?

3 Activity : Let's separate a mixture

What We Need:

nails, sand, piece of wood, a bowl, water, magnet, strainer

What to Do:

1. Make a table like the one shown below.

Matter	Properties
nails	
sand	
wood	

Can you guess how we can separate a mixture?

2. Observe each matter and write their properties in the table.
3. Pour these objects in the bowl and mix them together.
4. Think about the ways to separate the nails, sand and wood in the mixture by using water, a magnet and a strainer.
5. Separate the mixture based on your ideas.
6. Share your ideas with your classmates. Talk about how to separate a mixture.

4

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Teacher's Notes

(Continues from previous teacher's note - The Difference Between Homogeneous and Heterogeneous Mixed matters)

- Homogeneous mixed matters - more commonly called as 'homogeneous mixtures' - is a mixture where the components of the mixed matter (mixture) uniformly distributed throughout it. Thus, the composition and property of the mixture is the same throughout. Well stirred sugar water, air and petrol are the example of the homogeneous mixtures.
- Heterogeneous mixed matters - more commonly called as 'heterogeneous mixtures' - is a mixture where the components of the mixture are not uniform and thus different samples from the mixture have different composition and properties. Mumu in the previous lesson is the typical example of heterogeneous mixtures. Soil and sand are other famous examples.
- There are many ways of separating a mixture. Simple separation methods which are applicable with G3 students are introduced in the textbook above. Scientists use some laboratory techniques such as filtration, evaporation and distillation.
  - **Filtration**: Common method which uses a filter paper placed in a filter funnel to trap an insoluble solid in a liquid.
  - **Evaporation**: It heat the solution until the solvent evaporates (turns into gas) leaving behind the solid residue.
  - **Distillation**: The concept is similar to evaporation, but in distillation, the vapor of a liquid is collected by condensation.
- Details of these techniques are described in later grade. Important notice here is that the techniques use solutions, 'Using water' in this lesson is a beginning step for further study.

Lesson Objectives

Students will be able to:
- Identify the different ways used in separating mixtures.
- Describe why a mixture can be separated.

Assessment

Students are able to:
- State how to separate matters in a mixture using eyes, magnet, strainer and water.
- Explain that a mixture can be separated by using the properties of matter.
- Develop eagerness towards separating a mixture.

Summary

5

The properties of each matter in a mixture do not change. So, a mixture can be separated into each matter by using the properties of each matter. We can separate a mixture of nails, sand and wood in different ways.

Using Sight

Each matter in a mixture has the same properties such as size, colour and shape. We can separate a mixture by seeing the properties of matter.

Using a Magnet

Some matter are attracted to a magnet. We can separate nails from the mixture by using a magnet as a nail is made of iron.

Using a Strainer

We can separate sand from the mixture by using a strainer. Strainers separate a mixture by the size of its matter. The size of sand is small enough to pass through a strainer.

Using Water

Some matter float in water, some sink in water. We can separate wood from the mixture by using water. Wood can float in water but nails and sand sink.

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- Ask students to present the properties of nail, sand and woods and the ways to separate a mixture
- Write down students' answers on the blackboard.
- Confirm the answers with students.
- **Based on their findings,** ask these following questions.

Q:Why is a magnet useful in separating a mixture? (Because a magnet can attract the nails made of iron.)

Q:What property of matter does a strainer uses to separate a mixture? (A strainer can separate a mixture by the size of matter.)

Q:Why can we separate a mixture using water? (Because some matters can float on water and sink in water)

Q:Why can a mixture be separated using eyes, magnets, strainers or water? (Each matter has different properties. It can be separated by using its property.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard.
- Ask these questions as assessment:
  Q:What are the ways of separating mixtures?
  Q:Why can a mixture be separated using eyes, magnets, strainers or water?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"Separating a Mixture"

Key question

Q: How can we separate a mixture?

Activity

Let's separate a mixture

Matter	Properties
Nails	Size, shape, weight
Sand	Size, texture, colour
Wood	Colour, size, texture

Discussion

Q: Why is a magnet useful in separating a mixture? Because a magnet can attract the nails made of iron.

Q: What property of matter does a strainer uses to separate a mixture?

A strainer can separate a mixture by the size of matter.

Q: Why can we separate a mixture using water?

Because some matters can float on water and sink in water.

Q: Why can a mixture be separated using eyes, magnets, strainers or water?

Each matter has different properties. It can be separated by using its property.

Summary

- A mixture can be separated into each matter by their properties
- the ways to separate a mixture is:
  - Using sight
  - Using magnet
  - Using strainer
  - Using water

Unit	Chapter : **2. Properties of Matter**	Total lesson No: 25 / 94
Matter	Topic : **2.3 Mixing Matter**	Textbook page: 61 - 63

Lesson
16 / 17

Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (20 min.)

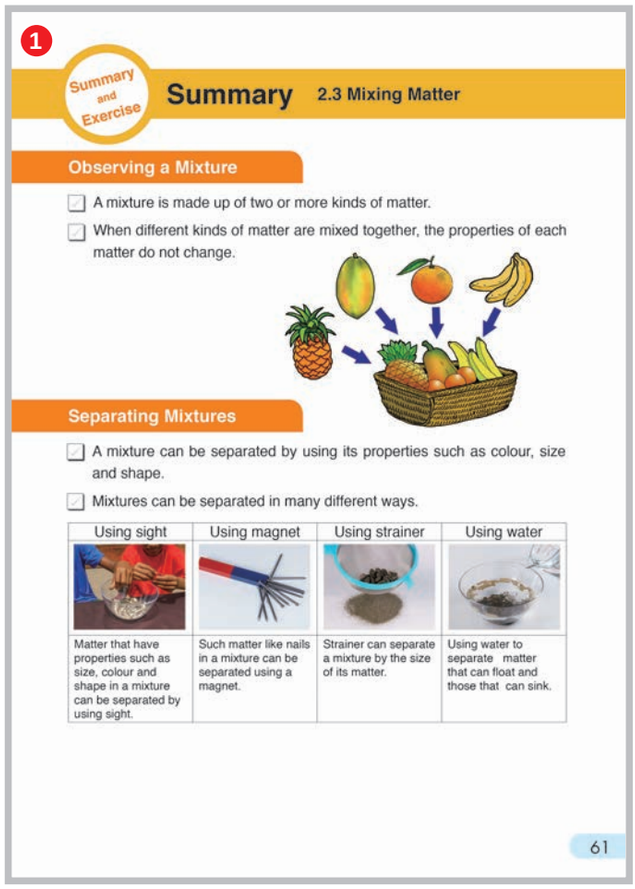
- Recap main learning contents in this topic 'Mixing Matter'.
- Ask some questions and verify students understanding.

Q: What is a mixture? A mixture is made of two or more kinds of matter

Q: What happens to the properties of each matter when they are in a mixture? The properties do not change

Q: How can mixtures be separated? By using sight, magnets, strainer and water

- Explain and correct learning contents again if they still have misconception.
- Provoke students to explain an example of how a mixture can be separated, Example: a mixture of kidney beans and rice grains.



1

Summary and Exercise

Summary 2.3 Mixing Matter

Observing a Mixture

- A mixture is made up of two or more kinds of matter.
- When different kinds of matter are mixed together, the properties of each matter do not change.

Separating Mixtures

- A mixture can be separated by using its properties such as colour, size and shape.
- Mixtures can be separated in many different ways.

Using sight	Using magnet	Using strainer	Using water
Matter that have properties such as size, colour and shape in a mixture can be separated by using sight.	Such matter like nails in a mixture can be separated using a magnet.	Strainer can separate a mixture by the size of its matter.	Using water to separate matter that can float and those that can sink.

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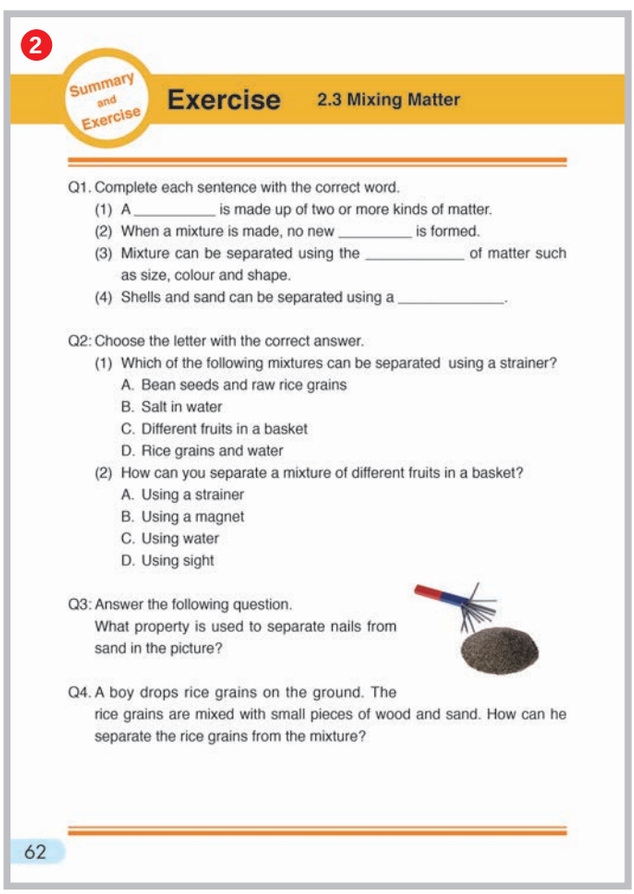
2 Exercise & Explanation (30 min.)

- Allow students to try answering questions individually with enough time in response to students understanding
- Explain to students each question to the students.
  - Question 1: Completion item. Ask students to recall their lessons and think of a suitable word to write in the blank space.
  - Question 2: Multiple choice – 2 questions
  - Question 3: Short answer question- 1 question.
  - Question 4: Comprehension question. Allow students to think and answer the question in their own words.
- After the exercise, give them answers of the questions and explain how to justify the answers.



2

Summary and Exercise

Exercise 2.3 Mixing Matter

Q1. Complete each sentence with the correct word.
(1) A _____ is made up of two or more kinds of matter.
(2) When a mixture is made, no new _____ is formed.
(3) Mixture can be separated using the _____ of matter such as size, colour and shape.
(4) Shells and sand can be separated using a _____.

Q2: Choose the letter with the correct answer.
(1) Which of the following mixtures can be separated using a strainer?
A. Bean seeds and raw rice grains
B. Salt in water
C. Different fruits in a basket
D. Rice grains and water
(2) How can you separate a mixture of different fruits in a basket?
A. Using a strainer
B. Using a magnet
C. Using water
D. Using sight

Q3: Answer the following question.
What property is used to separate nails from sand in the picture?

Q4. A boy drops rice grains on the ground. The rice grains are mixed with small pieces of wood and sand. How can he separate the rice grains from the mixture?

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Exercise answers

Q1.
(1) **Mixtures**
(2) **matter**
(3) **properties**
(4) **Strainer**

Q2.
(1) **D**
(2) **D**
The aim is for students to differentiate different ways of separating mixtures.

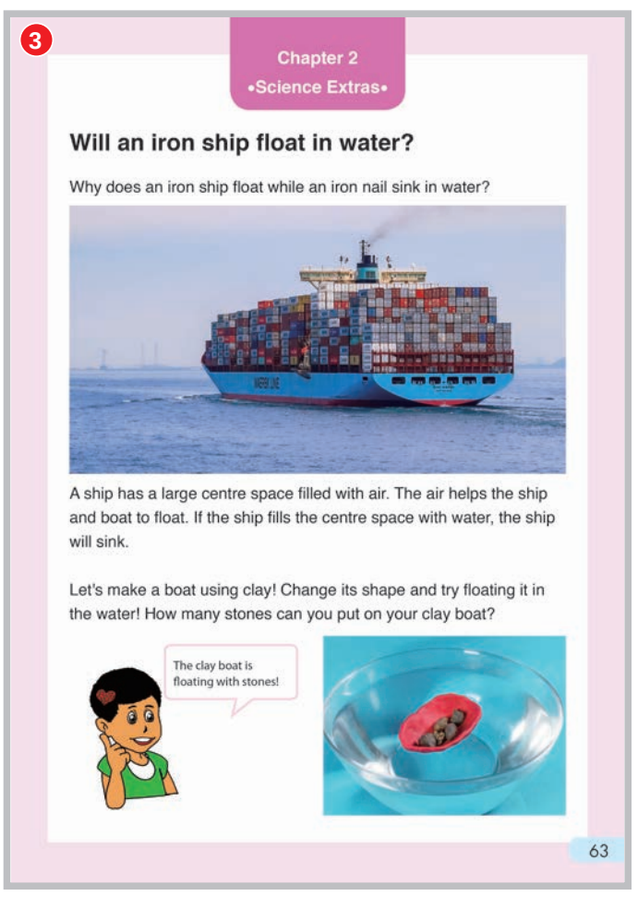
Q3.
Matter that are made from iron and can be attracted to magnet and in this situation the matter are nails.

Q4. Example of the answer
Step1. using strainer
He will use a strainer to separate sand, rice grain and pieces of wood.
Step2. using water
He will use water to separate rice grain from pieces of wood.
Students can answer by stating that separation can be a process in this situation firstly straining and then using water.

Explanation of Science Extras

3 Science Extras (10 min.)

- Give opportunities to students to closely observe the nature and its phenomena in the world.
- Allow students to ask questions that demonstrate curiosity about the content in the column.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Chapter 2
•Science Extras•

Will an iron ship float in water?

Why does an iron ship float while an iron nail sink in water?

A ship has a large centre space filled with air. The air helps the ship and boat to float. If the ship fills the centre space with water, the ship will sink.

Let's make a boat using clay! Change its shape and try floating it in the water! How many stones can you put on your clay boat?

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Lesson
17 / 17

Lesson Title

Chapter Test

Answer of the Chapter Test

Chapter Test

2. Properties of Matter

Q1 Complete each sentence with the correct word.

(1) Matter is everything around us.
(2) Matter can be described by their Properties such as colour, size and shape.
(3) Weight is how heavy or light a matter is.
(4) Volume is the amount of space matter takes up.
(5) Volume of water is often measured in millilitre or litre.
(6) A mixture is something made of two or more kinds of matter.

Q2 Choose the letter with the correct answer.

(1) Which tool is used to measure the volume of water?
(A) A balance
B. A measuring cylinder
C. A thermometer
D. A magnet

(2) Which sentence is not true about matter?
A. All matter has weight and takes up space.
B. Some matter like air cannot be seen.
C. Size, shape, color and texture are properties of matter.
(D) All matter sink in the water.

(3) Which of the following would happen when you change the shape of a clay?
A. The weight of the clay becomes lighter.
B. The weight of the clay becomes heavier.
(C) The weight of the clay doesn't change.
D. The weight of the clay becomes zero.

(4) Michael prepared two plastic bottles with the same volume. He filled each bottle with sand and water and compared the weights. Which of the explanations is correct about volume and weight?
A. The same volume of sand and water have the same weight.
(B) The same volume of sand and water have different weights.
C. The same volume of sand and water do not have weight.
D. The same volume of sand and water sometimes have the same weight.

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Q3

(1) Garry poured cooked spaghetti and water into a strainer to separate the two matters. How does the strainer separate the spaghetti from the water?

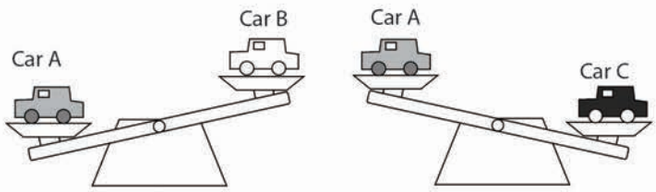
A strainer has holes that passes water. But it does not pass the spaghetti so that only the spaghetti remains on the strainer

(2) A cup was placed under a dripping tap. After a while, water started spilling out. Why does the water spill out from the cup?

Because the space in the cup was already occupied by water.

(3) A student compares the weight of three toy cars using a balance. His observation results are shown below. Which toy car is the heaviest?

Car C is the heaviest.



Q4

Kay filled a beaker with water up to 50 millilitres. She then put in a stone and the level of the water rose up to 75 millilitres.

a) How many millilitres does the water level increase by?

25 mL

b) Explain why the level of water rose when she put the stone into the beaker.

Because the stone took up some space in the beaker therefore, the level of water rose up.

c) What is the volume of stone?

25 cm^3

Strand : LIFE
Unit : PLANTS

Chapter 3. Characteristics of Plants

Chapter Objectives

Students will be able to understand the characteristics of plants including their common parts by observing plants around them.

Students will be also able to classify plants according to a common feature of their roots, stems and leaves.

Topic Objectives

3.1 Observing Plants

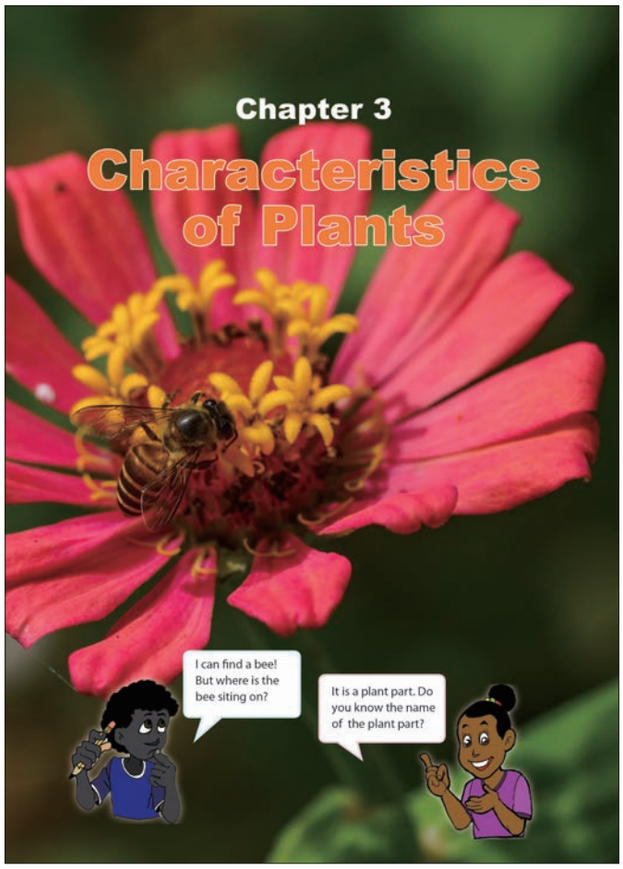
Students will be able to;

- Observe plants living in different places.
- Identify common parts of plants such as roots, stems, leaves and flowers.
- Describe how the plant uses its parts to meet their basic needs.

3.2 Grouping Plants

Students will be able to;

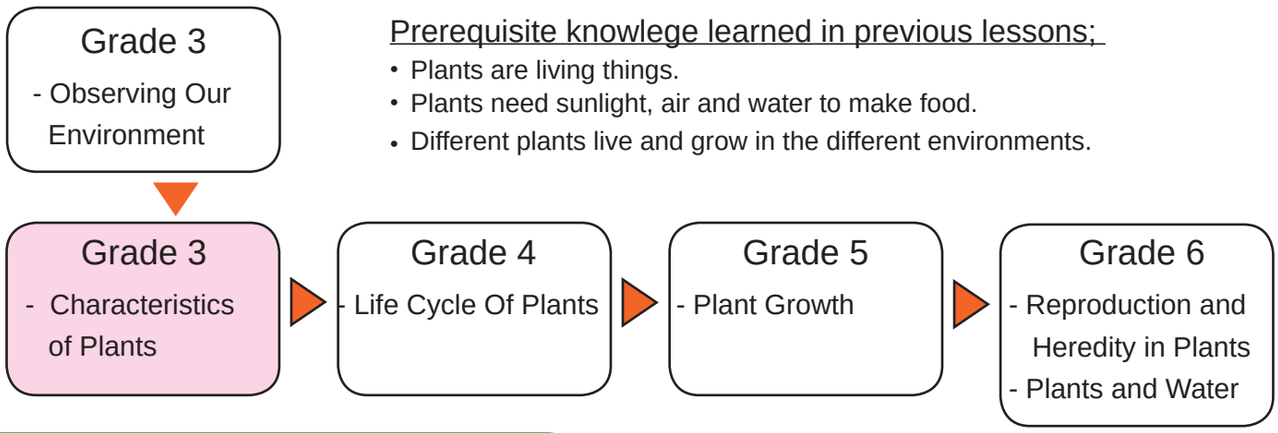
- Group roots into two types of roots, taproots and fibrous roots.
- Group stems by its colour, hardness and size
- Group leaves by shapes of its edge and blade and patterns of its vein.



Picture in the chapter heading in the textbook shows a flower that attracts a bee.

Related Learning Contents

The learning contents in this chapter connect to the following chapters.



Teaching Overview

This chapter consists of 9 lessons, each lesson is a double period.

Topic	Lesson No.	Lesson Title and Key Question	Content standard in syllabus	Textbook page number
3.1 Observing Plants	1	**Plants around Us** Where do plants live and grow?	3.1.1	67 - 68
	2	**Observing Plant Parts** How are the parts of plants common?		69 - 70
	3	**Functions of Plant Parts** How do plants use their parts?		71 - 72
	4	Summary and Exercise		73 - 74
3.2 Grouping Plants	5	**How to Group Plants: Roots** How can plants be grouped by their roots?		75 - 76
	6	**How to Group Plants: Stems** How can plants be grouped by their stems?		77 - 78
	7	**How to Group Plants: Leaves** How can plants be grouped by their leaves?		79 - 80
	8	Summary and Exercise		81 - 83
Chapter Test	9	Chapter Test		84 - 85

Unit	Chapter : **3. Characteristics of Plants**	Total lesson No: 27 / 94
Plants	Topic : **3.1. Observing Plants**	Textbook page: 67 - 68

Lesson 1 / 9

Lesson Title

Plants around Us

Preparation

- Chart paper, marker

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson on 'Living Things in the Environment' in Chapter 1.
- Show pictures about different environment as mentioned and ask;

Q:In what kinds of environment do living things live?

- Encourage students to think about the place where plants grow by asking;

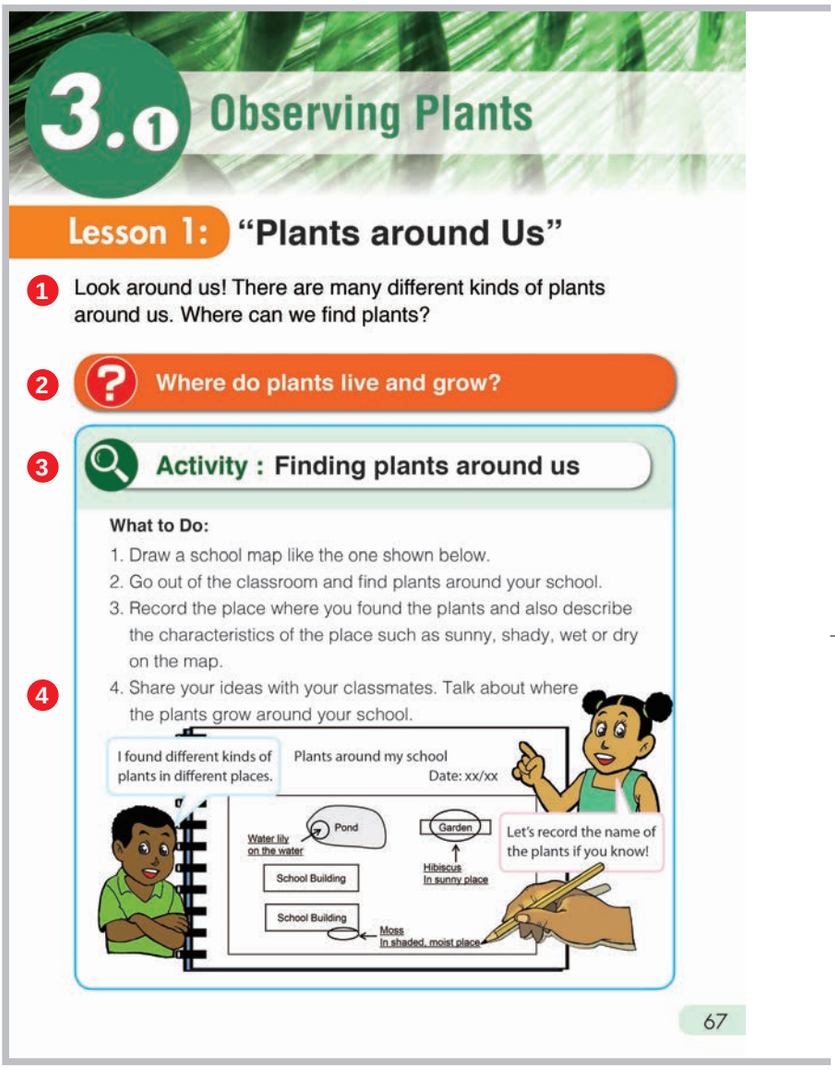
Q:Where do plants live and grow?

2 Introduce the key question

Where do plants live and grow?

3 Activity (30 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Ask students to draw a school map in their exercise books.
- Remind students of safety rules.
- Have students observe around their school environment with the map and record the places where they find plants, the characteristics of the places and the name of the plants on the map.
- After observation, let students discuss and summarise findings in a group.
- Assist students to give correct names of plants.
- Give enough time for students to discuss their findings in groups



Teacher's Notes

Important notes for outdoor activity

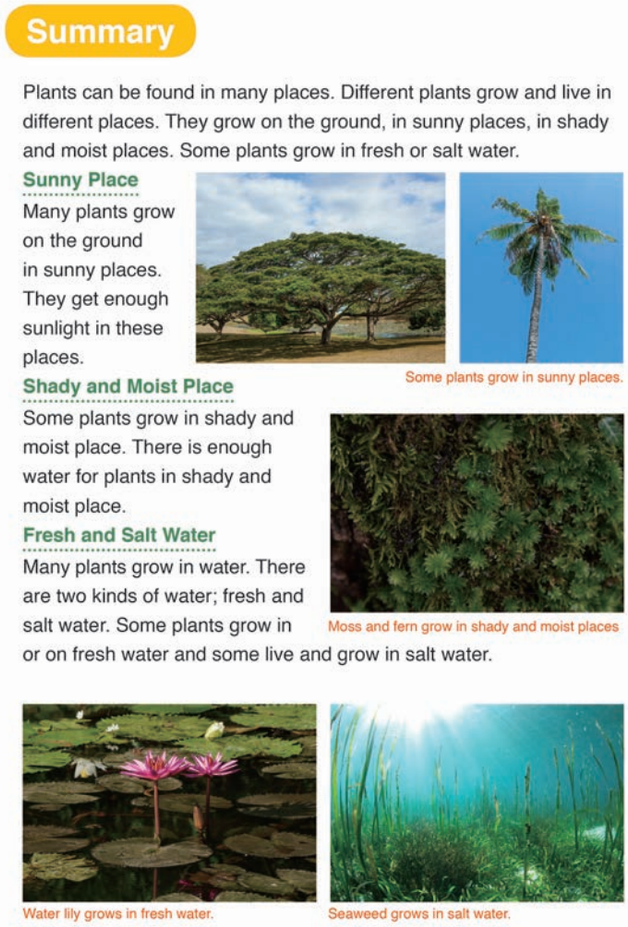
- Make students to work in groups to find plants for safety reason and collaborative work.
- Let students to explore and names the plants (If students know local names only, other students or teacher can help them to know English names in the classroom.)
- Allocate different groups to different places, so that students can be able to identify different plants growing in various environments.
- Have ground rules for students for outdoor activity for safety purposes.
  - ➡ Plants are adapted to live in specific environments. They need certain temperatures to survive. Plants need the right amounts of rain and sunlight.
  - ➡ Plants are everywhere around us, but how do plants grow and what makes plants grow? There are many things plants need to grow such as water, nutrients, air, water, light, temperature, space and time.

Lesson Objectives

Students will be able to:
- Identify different kinds of plants in their surrounding environment.
- Describe the characteristics of the places where plants grow.

Assessment

Students are able to:
- Explain the types of the places where plants grow and their characteristics.
- Record the places where plants grow in a school map through their observation.
- Investigate cooperatively the plants around them.



Summary

Plants can be found in many places. Different plants grow and live in different places. They grow on the ground, in sunny places, in shady and moist places. Some plants grow in fresh or salt water.

Sunny Place

Many plants grow on the ground in sunny places. They get enough sunlight in these places.

Some plants grow in sunny places.

Shady and Moist Place

Some plants grow in shady and moist place. There is enough water for plants in shady and moist place.

Moss and fern grow in shady and moist places

Fresh and Salt Water

Many plants grow in water. There are two kinds of water; fresh and salt water. Some plants grow in or on fresh water and some live and grow in salt water.

Water lily grows in fresh water.

Seaweed grows in salt water.

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4 Discussion for findings (15 min.)

- Draw a school map on a black board.
- Ask each group to present their findings.
- Write down their findings in the map on the blackboard.
- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:In what kinds of place did you find plants? (Sunny place, shaded place, moist place, water, etc)

Q:What kinds of plants did you find? (It depends on the school)

Q:Did you find different kinds of plants in the same place or different place? (Different kinds of plants live in different places.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard
- Ask these questions as assessment:
  Q:In what places do plants live and grow?
  Q:What are some examples of plants that live in water?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

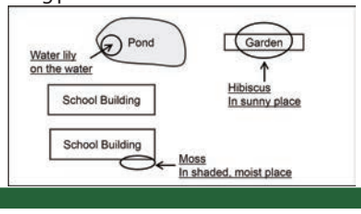
"Plants around us"

Key question

Where do plants live and grow?

Activity

Finding plants around us



Discussion

Q: In what kinds of place did you find plants?
Sunny place, shaded place, moist place, water, etc

Q: What kinds of plants did you find?
(It depends on school)

Q: Did you find different kinds of plants in the same place or different place?
Different kinds of plants live in different places.

Summary

- Different plants grow and live in different places.
- Plants grow in different places such as:
  - Sunny place e.g. Hibiscus, mango tree
  - Shaded and moist place e.g. moss
  - Fresh and Salt water: e.g. water lily

Unit **Plants**	Chapter : **3. Characteristics of Plants** Topic : **3.1. Observing Plants**	Total lesson No: 28 / 94 Textbook page: 69 - 70

Lesson
2 / 9

Lesson Title

Observing Plant Parts

Preparation

- Colours /crayons

Lesson Flow

1 Introduction (5 min.)

- Review the previous lesson.

Q:In what places do plants live and grow?

- Motivate students to think about the place where plants grow by asking;

Q:There are many different kinds of plants. How are the plants alike or different?

2 Introduce the key question

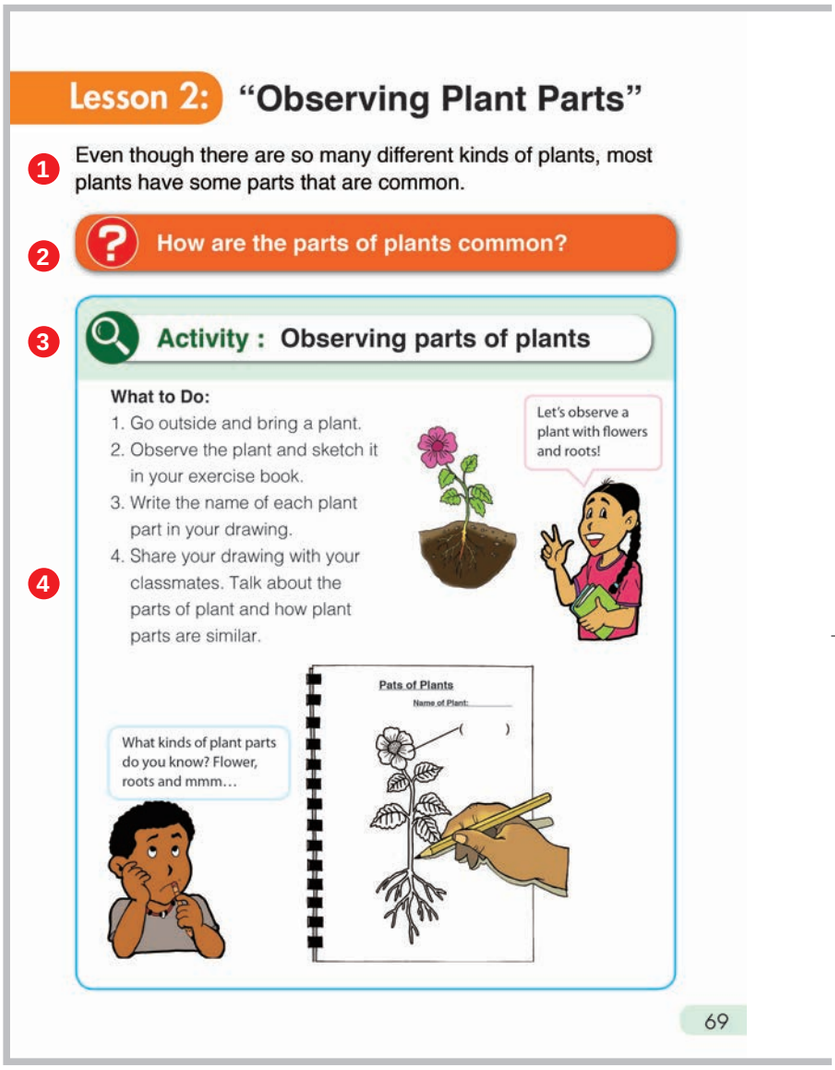
How are the parts of plants common?

3 Activity (25 min.)

- Organise students in some groups.
- Explain steps of activity.
- Let students go outside and find some plants with leaves, flowers and roots.
- Have students observe and sketch the plant.
- After drawing, let them label the parts of plant in their drawing.
- Ask students to discuss how the parts of plants look and summarise their findings on the chart in groups.

4 Discussion for findings (20 min.)

- Draw a picture of a plant on a black board.
- Ask each group to present their drawings and their findings. (Continue)


Lesson 2: "Observing Plant Parts"

1 Even though there are so many different kinds of plants, most plants have some parts that are common.

2 How are the parts of plants common?

3 Activity : Observing parts of plants

What to Do:
1. Go outside and bring a plant.
2. Observe the plant and sketch it in your exercise book.
3. Write the name of each plant part in your drawing.
4. Share your drawing with your classmates. Talk about the parts of plant and how plant parts are similar.

4

Let's observe a plant with flowers and roots!

What kinds of plant parts do you know? Flower, roots and mmm…

Pats of Plants
Name of Plant:

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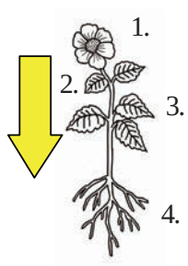
Teacher's Notes

- Students bring various plants from homes and teacher must have own sample that consists of all plant parts.
- Remind students to select only one plant for this activity.
- There are flowering and non-flowering plants.
- This activity should use flowering plants which have roots, stem, and leaves.
- Scientific sketch is NOT an artwork. The sketch requires precise drawing. If the plant has two leaves, the sketch should have 2 leaves only as they are.

How to sketch drawing

Principle of sketch is 'top to bottom' and 'front side to back side'.
For instance, with the sample at right;

1. Start by drawing the flower of the plant.
2. Next draw the stem.
3. Next the leaf. Draw from front leaf to back.
4. Lastly draw the root.

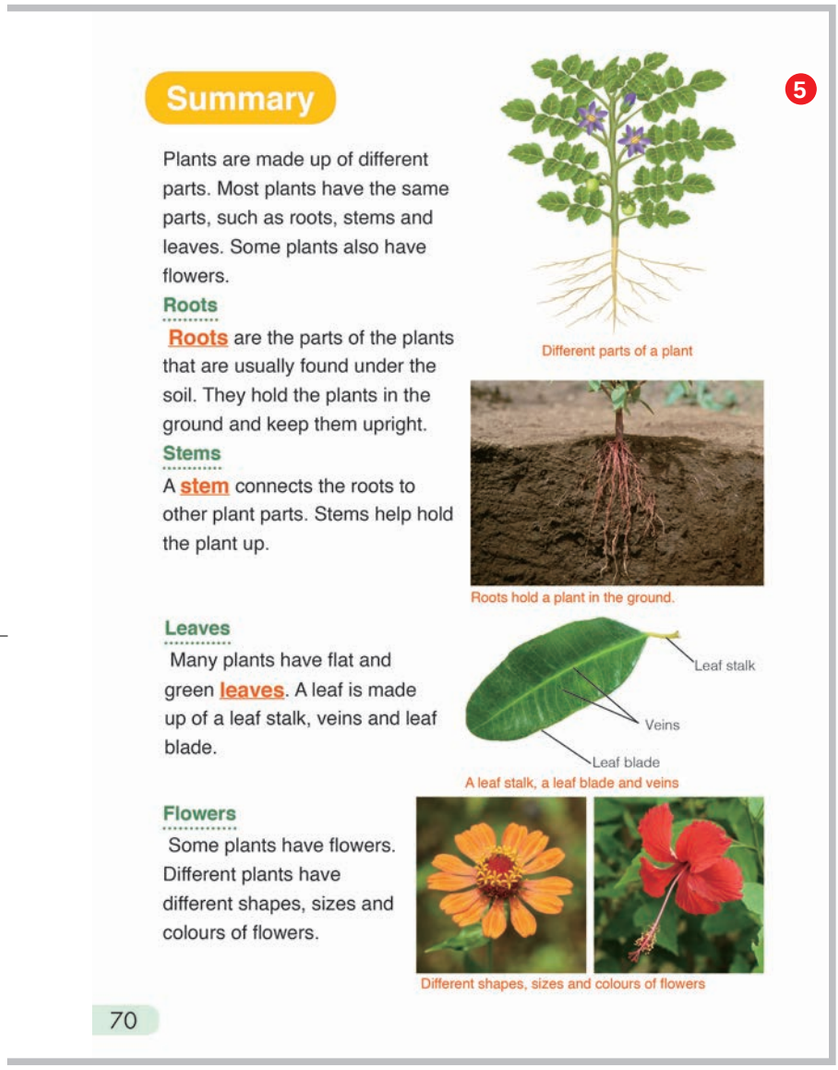


Lesson Objectives

Students will be able to:
- Observe the parts of a plant.
- Identify the parts of a plant.

Assessment

Students are able to:
- Explain the common parts of a flowering plant as roots, leaves, stem and flowers.
- Draw and label parts of flowering plant.
- Develop eagerness towards observing different parts of plant.



Summary

Plants are made up of different parts. Most plants have the same parts, such as roots, stems and leaves. Some plants also have flowers.

Roots

Roots are the parts of the plants that are usually found under the soil. They hold the plants in the ground and keep them upright.

Stems

A **stem** connects the roots to other plant parts. Stems help hold the plant up.

Leaves

Many plants have flat and green **leaves**. A leaf is made up of a leaf stalk, veins and leaf blade.

Flowers

Some plants have flowers. Different plants have different shapes, sizes and colours of flowers.

5

Different parts of a plant

Roots hold a plant in the ground.

Leaf stalk
Veins
Leaf blade

A leaf stalk, a leaf blade and veins

Different shapes, sizes and colours of flowers

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- Write down students' findings in the picture on the blackboard.
- Confirm the findings with students.
- **Based on their results,** ask the following question as discussion point.

Q:What kinds of plant parts did you find? (Leaves, stem, roots, flowers, etc)

Q:How are the parts of plants different? (They are different in their shapes, colours, and sizes.)

Q:What are the common parts of all plants? (Most plants have roots, leaves, flowers and stem in common.)

5 Summary (5 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard. (Refer to blackboard sample)
- Ask these questions as assessment:
  Q:What are the common parts that make up a plant?
  Q:Explain the characteristics of roots, leaves, flowers and stem.
  Q:What makes plant parts different?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

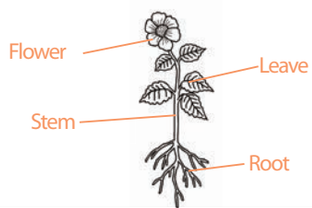
Title:

"Observing Plant Parts"

Key question

How are the parts of plants common?

Activity Observing Parts of plants



Discussion

Q: What kinds of plant parts did you find?

Leaves, stem, roots, flowers, etc

Q: How are the parts of plants alike or different?

The shape, colour, and size are different.

Q: What are the common parts of all plants?

Most plants have roots, leaves, flowers and stem in common.

Summary

- Most plants have roots, stems, leaves, and flowers in common.

1. Roots
   They hold the plants in the ground and keep them upright.
2. Stems
   Stems help hold a plant up.
3. Leaves
   A leaf is made up of a leaf stalk, a leaf blade, and veins.
4. Flowers
   Different plants have different shapes, sizes, and colours of flowers.

Unit **Plants**	Chapter : **3. Characteristics of Plants** Topic : **3.1. Observing Plants**	Total lesson No: 29 / 94 Textbook page: 71 - 72

Lesson
3 / 9

Lesson Title

Function of Plant Parts

Preparation

- Plant
- water,
- Food colouring,
- Glass
- container

Lesson Flow

1 Introduction (5 min.)

- Review previous lesson

Q:What are the common parts that make up a plant?

- Arouse students to think about the place where plants grow by asking;

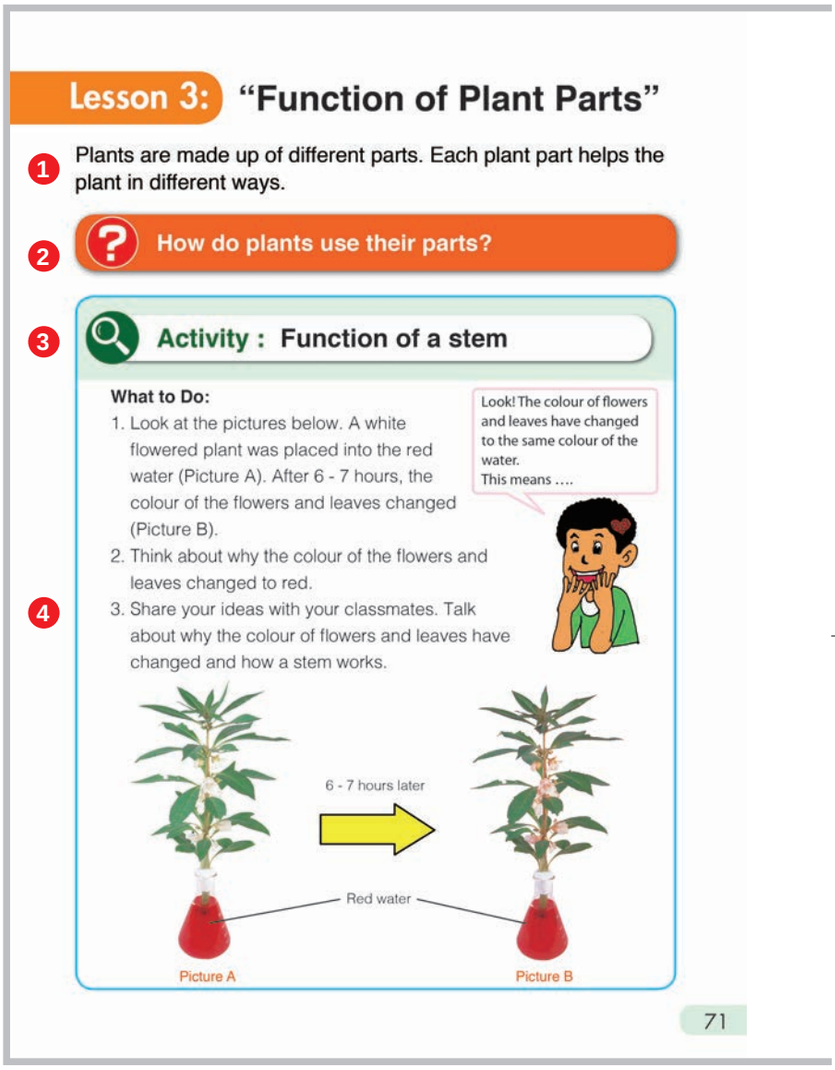
Q:How does each plant part help the plants?

2 Introduce the key question

How do plants use their parts?

3 Activity (25 min.)

- Organise students into some groups.
- Explain the steps of the activity.
- Have students observe two pictures of flowers in this activity and think about the reason why the colour of flower and leaves are changed.
- If possible, prepare the flowering plants and the coloured flowering plants with food colouring and show them to students.
- Advise students to refer to the character's talking for their investigation.
- Ask students to discuss the reason why the colour of flowers and leaves were changed and how a stem works based on their ideas in a group.



Teacher's Notes

Plant parts and its function

- The main parts of a plant are the roots, the stem and the leaves.
- The root takes in water and nutrients from the ground.
- The stem carries food, water and nutrient from the roots and leaves.
- A leaf uses sunlight and air to help the plant make food.
- This activity explains that those parts are connected and function together.

Facilitation Guide

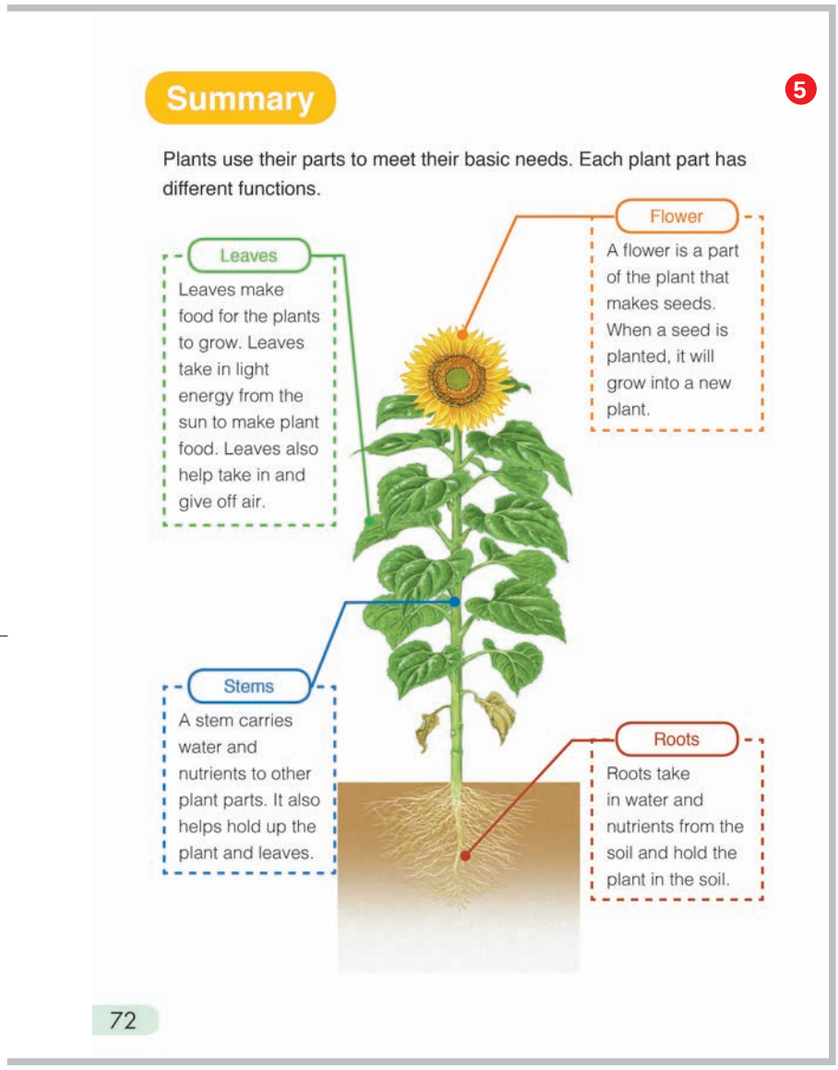
- Prepare materials prior to lesson and try out.
- Red food coloring can be substituted to other water-soluble stains, however, the particles of those coloring is too big to be passed through the root and stem in most cases. Teachers are strongly suggested to find proper food color and plants prior to the lesson. Celery, Chinese cabbage and potato are good plants to use for this activity.
- The activity takes 6~8 hours and thus it cannot be covered in one lesson. The discussion and summary should be resumed in later lesson.

Lesson Objectives

Students will be able to:
- Identify the function of plant parts.
- Observe the changes in the colour of a plant parts.

Assessment

Students are able to:
- Explain how each part of a plant works.
- Infer the reason why the colour of flowers and leaves were changed and how a stem works in the activity.
- Co-operate with others in conducting the experiment.



4 Discussion for findings (20 min.)

- Ask each group to present their ideas.
- Write down students' ideas on the blackboard.
- Facilitate students taking part in the discussion actively.
- Confirm the ideas with students.
- **Based on their findings,** ask the following questions.

Q:Why did the flowers change colour from white to red, not blue or other colours? (Because the plant was placed into red coloured water)

Q:Which part of the plant helped the flowers and leaves change colour? (Stem)

Q:How does the stem work? (Stem carries water to the other parts of plants.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard.
- Ask these questions as assessment:
  Q:Why do plants use their parts?
  Q:What are the functions of plant parts such as roots, leaves, stems and flowers?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:
"Function of plant parts"

Key question
How do plants use their parts?

Activity
Function of a stem.

Q: Why was the colour of flowers and leaves changed?
(Write down students' ideas here.)
Q: How did a stem work?
(Write down students' ideas here.)

Discussion
Q: Why did the flowers change colour from white to red, not blue or other colours?
Because the plant was placed into red coloured water and the red water came up to flowers and change the colour of the flowers to red.
Q: Which part of the plant helped the flowers and leaves change colour?
Stem
Q: How does the stem work?
Stem carries water to the other parts of plants.

Summary
Plants use their parts to meet their basic needs. Each plant part has different function.
1. Roots:
   They take in water and nutrients from soil and hold the plant in the soil.
2. Stem:
   It carries water and nutrients from roots to other parts.
3. Leaves:
   They collect sunlight to make food to grow and help take in and give off air.
4. Flowers:
   They are a part of plants that make seeds.

Unit	Chapter : **3. Characteristics of Plants**	Total lesson No: 30 / 94
Plants	Topic : **3.1 Observing Plants**	Textbook page: 73 - 74

Lesson
4 / 9

Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (20 min.)

- Recap main learning contents in this topic 'Observing Plants'.
- Ask some questions and verify student understanding.

Q:Where can we find plants? Sunny, shaded, moist, fresh and salt water.

Q:Were the plants same in different places? No

Q:What are the parts of plants? Roots, stem, leaves, flowers.

- Explain and correct learning contents again if they still have misconceptions.
- Provoke students to explain the basic needs of plants by asking.

Q:What do plants need in order to survive? Soil, water, air, sunlight and space.

- Ask students about plant parts and their functions in the growth and survival of a plant.

2 Exercise & Explanation (30 min.)

- Allow students to try answering questions individually with enough time in response to their understanding.
- Question 1: Completion item. Ask students to recall their lessons and think of a suitable word to write in the blank space.
  Question 2: Multiple choice - 2 questions.
  Question 3: Short answer question - 2 questions.
  Question 4: Comprehension question. Allow students to think and answer the question in their own words.
- After the exercise, give them answers of the questions and explain the answers.

1

Summary and Exercise

Summary 3.1 Observing Plants

Plants around us

- Different plants grow and live in different places.
- Plants can be found in sunny places, shady and moist places and fresh and salt water.

Sunny place	Shady and moist place	Fresh and salt water
		

Parts of Plants

- Most plants have parts that are common, such as roots, stem and leaves. Some plants also have flowers.

Roots	Stem	Leaves	Flower
			

Function of Plant parts

- Each plant part has its function to help the growth of a plant.
  - Roots: Roots take in water and nutrients from soil and hold the plant in the soil.
  - Stem: A stem carries water and nutrients to the other plant parts. It also helps hold up a plant and its leaves.
  - Leaves: Leaves take in sunlight, make food for the plants and help take in and give off air.
  - Flower: A flower is the part of the plant that make seeds.

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2

Summary and Exercise

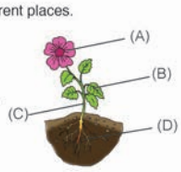
Exercise 3.1 Observing Plants

Q1. Complete each sentence with the correct word.
(1) _____ plants grow in different places.
(2) Most plants have parts that are common; roots, stem, flowers and _____.
(3) A _____ carries water and nutrient to plant parts.
(4) A _____ makes seeds and fruits.

Q2. Choose the letter with the correct answer.
(1) Why are plant roots under the soil?
A. To grow a flower in the ground.
B. To get sunlight in the ground.
C. Take in water from the soil.
D. To get air from the soil.

(2) Which of these sentences is correct about plants.
A. Different plants grow and live in different places.
B. All plants grow in sunny places.
C. No plants grow in fresh water.
D. Different plants cannot grow in different places.

Q3. Answer the following questions.
(1) Look at the picture on the right. Name the plant part beside each letter.
(2) What is the function of plant part (D)?



Q4. Which of the plant's needs would no longer be met if you cut off the roots?

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Exercise answers

Q1.
(1) **Different**
(2) **leaves**
(3) **stem**
(4) **flowers**

Different plants are found in different places
Sunlight is one of the basic needs a plant needs.
Plant parts have different functions to perform in order to make the plant survive such as flower makes seeds and fruits.

Q2.
(1) **C**
(2) **A**

Roots take in water and nutrients from the soil and hold the soil and keep plants upright.

Q3.
(1) (A) **flower**
(B) **leaf(leaves)**
(C) **stem**
(D) **roots(root)**
(2) **A stem transports water and nutrients to all parts of the plant.**

Q4. Example of the answer
Plants will have no water and nutrients taken from the roots and the plant would die
Explain that the function of plant's roots is to take water and nutrients from the soil.

Unit	Chapter : **3. Characteristics of Plants**	Total lesson No: 31 / 94
Plants	Topic : **3.2. Grouping Plants**	Textbook page: 75 - 76

Lesson 5 / 9

Lesson Title

How to Group Plants: Roots

Preparation

- A actual plant with its roots attached

Lesson Flow

1 Introduction (10 min.)

- Review the lesson on 'Observing Plant Parts' in Topic 1 by asking:

Q:What are the common parts that make up a plant?

- Show the students a plant with its roots attached, ask:

Q:Do you think all plants have the same root like this one?

2 Introduce the key question

How can plants be grouped by their roots?

3 Activity (20 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Have students do the activity.
- Instead of observing the pictures in this activity, teacher can also ask students to collect plants with roots for their observation. In this case, facilitate students to collect two kinds of plants that have taproots and fibrous roots.
- Have students record their findings in the table.
- Ask students to discuss how roots are alike or different based on their findings.

4 Discussion for findings (20 min.)

- Ask each group to present the findings from their activity. (Continue)

3.2 Grouping Plants

Plants are made up of different parts such as roots, stems, leaves and flowers. How can plants be grouped by their parts?

Lesson 1: "How to Group Plants: Roots"

1 Most plants have roots. Different plants have different roots. How can we group plants by their roots?

2 How can plants be grouped by their roots?

3 Activity : Comparing roots

What to Do:

1. Make a table like the one shown below.

How are they alike?	How are they different?

2. Look at the pictures below. Observe the two kinds of roots and describe how they are alike or different in the table.
3. Share your ideas with your classmates. Talk about how the roots are alike or different and how we can group plants by their roots.

4

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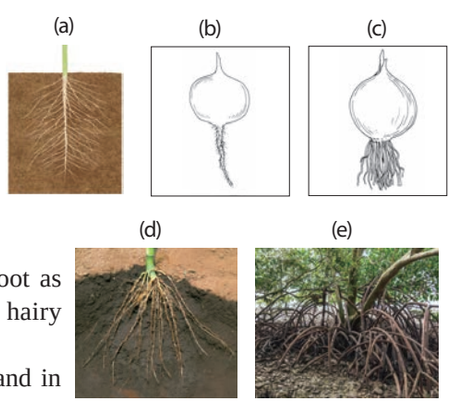
Teacher's Notes

- A taproot and a fibrous root are the major classification of the root system.
- Students may misunderstand a taproot has an edible root like a carrot, but the original definition is that it has a main dominant root with small roots (rootlets) shown as figure (a) regardless of the edibility.
- Students also may think a radish (b) and an onion (c) are the same root system because they look alike. But a radish (b) is a taproot composed of a main root and rootlets, conversely, an onion (c) is a fibrous root with many hairy roots.
- A root that expands large number of branches is called an adventitious root as shown in (d). A fibrous root is actually a type of adventitious root with hairy ones.
- An adventitious root can be found not only underground, but on surface and in air. Mangrove root (e) is a typical example of an aerial adventitious root.

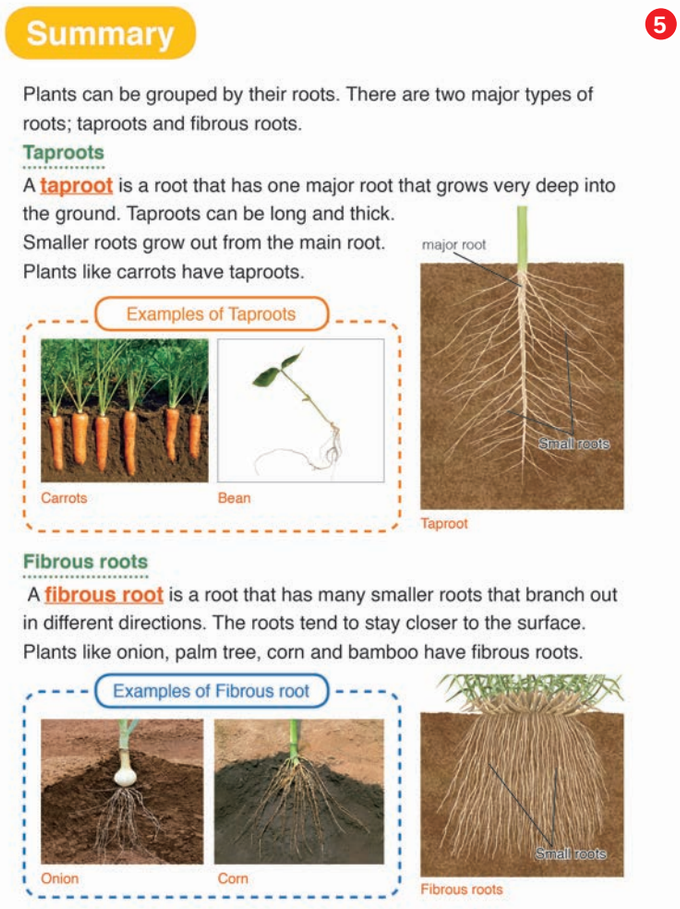


Lesson Objectives

Students will be able to:
- Classify the plants into two groups based on the types of roots.
- Describe the differences between a taproot and a fibrous root.

Assessment

Students are able to:
- Explain how to group plants based on the shapes of roots.
- List the similarities and differences of taproots and fibrous roots in the table.
- Appreciate other student opinions and ideas.



Summary

5

Plants can be grouped by their roots. There are two major types of roots; taproots and fibrous roots.

Taproots

A **taproot** is a root that has one major root that grows very deep into the ground. Taproots can be long and thick. Smaller roots grow out from the main root. Plants like carrots have taproots.

Examples of Taproots

Carrots

Bean

major root

Small roots

Taproot

Fibrous roots

A **fibrous root** is a root that has many smaller roots that branch out in different directions. The roots tend to stay closer to the surface. Plants like onion, palm tree, corn and bamboo have fibrous roots.

Examples of Fibrous root

Onion

Corn

Small roots

Fibrous roots

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- Write down students' findings in the table on the blackboard.
- Confirm the findings with students.
- Students present their observation results from the activity.
- **Based on their findings,** ask questions as discussion points.

Q:What characteristics does Root (A) have?
(It has one thick and long part of root, small roots grow out from the thick and long root, etc.)

Q:What characteristics does Root (B) have?
(There are many smaller roots, many small roots branch out in different directions, etc)

Q:How can we group plants based on roots?
(We can group plants based on the shape of roots)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson.
- Ask these questions as assessment:
  Q:What are the two main types of roots?
  Q:What are the characteristics of taproots and fibrous roots?
  Q:What are some examples of plants that have taproots and fibrous roots?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"How to group plants: Roots"

Key question

How can plants be grouped by their roots?

Activity Comparing roots

How are they alike?	How are they different?
Mainly hair like roots	Mainly a thick root in Root (A)
Roots spread out	Many small roots in Root (B)
etc	etc

Discussion

Q: What characteristics does Root (A) have?

It has one thick and long part of root, small roots grow out from the thick and long root, etc

Q: What characteristics does Root (B) have?

There are many smaller roots, many small roots branch out in different directions, etc

Q: How can we group plants based on roots?

We can group plants based on the shape of roots

Summary

There are two major types of roots.

1. Taproot
   It is a root that has major root that grows very deep into the ground.
   Taproots can be long and thick. Smaller roots grow out from the main root.
   Plants like carrots have a taproot.
2. Fibrous root
   It is a root that has many smaller roots that branch out in different directions.
   The roots tend to stay nearer to the surface.
   Plants like onion and corn have fibrous roots.

Unit	Chapter : **3. Characteristics of Plants**	Total lesson No: 32 / 94
Plants	Topic : **3.2. Grouping Plants**	Textbook page: 77 - 78

Lesson 6 / 9

Lesson Title

How to Group Plants: Stems

Preparation

- Nil

Lesson Flow

1 Introduction (10 min.)

- Review the previous lesson.

Q:What are the two main types of roots?

Q:What are the characteristics of taproots and fibrous roots?

- Encourage students to think about how to group plants by stems by asking;

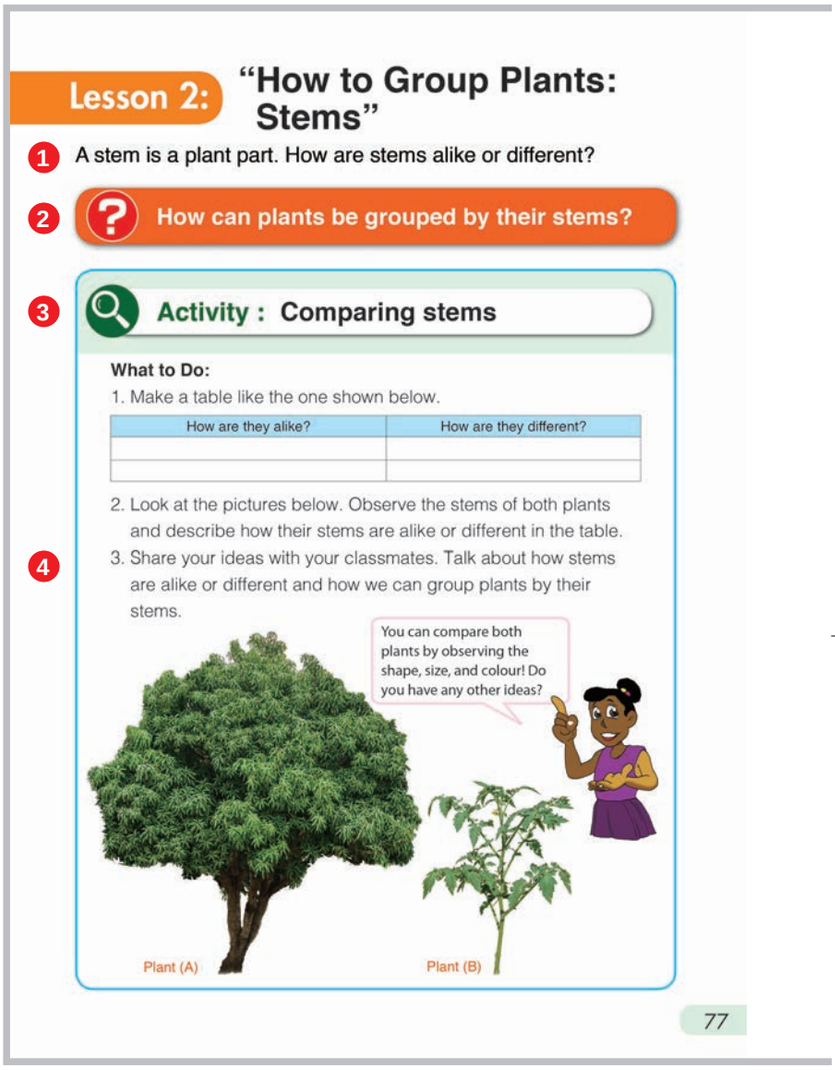
Q:Plants can be grouped by the shape of roots. Can we group plants based on the stem?

2 Introduce the key question

How can plants be grouped by their stems?

3 Activity (20 min.)

- Organise students into some groups.
- Explain the steps of the activity.
- Have students do the activity.
- Instead of observing the pictures in this activity, teacher can also ask students to go outside and observe the stems of a tree and an herb. In this case, explain the ground rules for outside activity.
- Have students record their findings in the table.
- After that, ask students to discuss how stems are alike or different based on their findings in a group.



Lesson 2: "How to Group Plants: Stems"

1 A stem is a plant part. How are stems alike or different?

2 How can plants be grouped by their stems?

3 Activity : Comparing stems

What to Do:

1. Make a table like the one shown below.

How are they alike?	How are they different?

2. Look at the pictures below. Observe the stems of both plants and describe how their stems are alike or different in the table.
3. Share your ideas with your classmates. Talk about how stems are alike or different and how we can group plants by their stems.

4

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Teacher's Notes

- Simple definition of
  - **Herbs** - any seed-bearing plant that does not have a woody stem and dies down to the ground after flowering.
  - **Shrubs** - a woody plant that is smaller than a tree and has several main stems arising at or near the ground.
  - **Trees** - a woody perennial plant, typically having a single stem or trunk growing to a considerable height and bearing lateral branches at some distance from the ground.
- Students should at least record 3 – 4 different plants stems in their table

	Tree	**Herb**
Shape		
Size/thickness		
Colour		
Hardness		
Texture		

Lesson Objectives

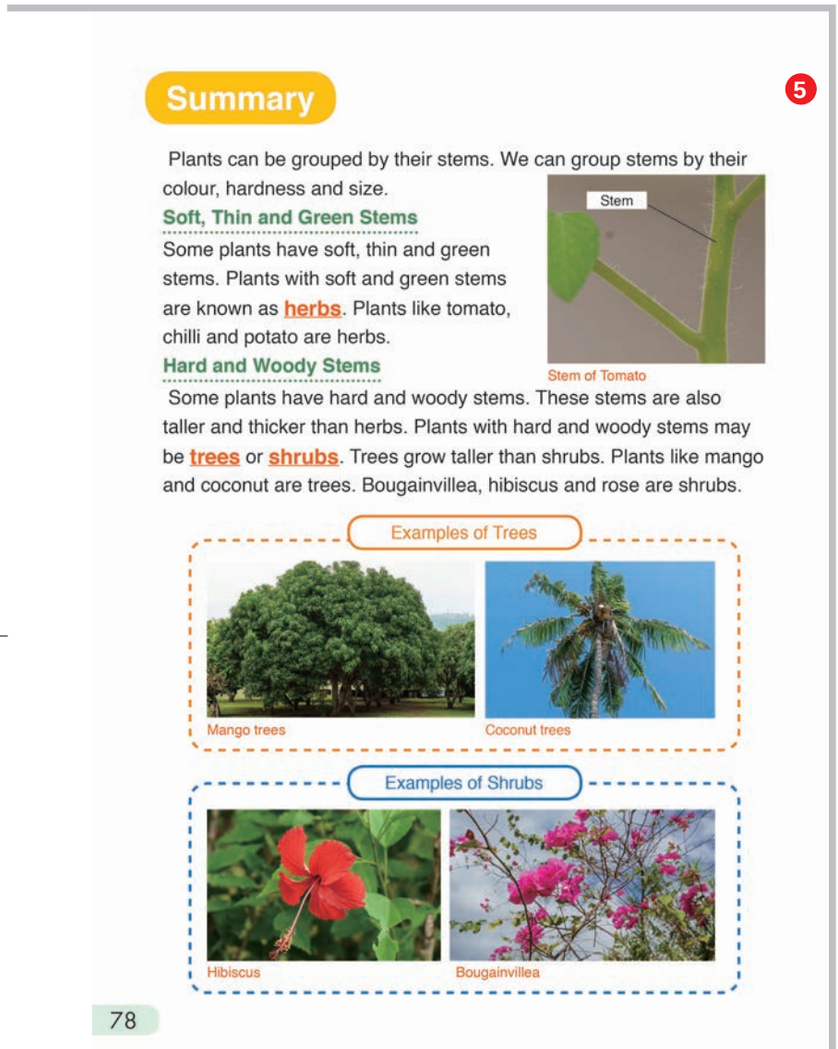
Students will be able to:

- Classify the plants into two groups based on the types of stems.
- Describe the differences between herbs, shrubs and trees.

Assessment

Students are able to:

- Explain how to group plants based on the colour, hardness and size of stems.
- List the similarities and differences of different stems of plants in the table.
- Respect each other's responses during discussion.



Summary

Plants can be grouped by their stems. We can group stems by their colour, hardness and size.

Soft, Thin and Green Stems

Some plants have soft, thin and green stems. Plants with soft and green stems are known as **herbs**. Plants like tomato, chilli and potato are herbs.

Stem of Tomato

Hard and Woody Stems

Some plants have hard and woody stems. These stems are also taller and thicker than herbs. Plants with hard and woody stems may be **trees** or **shrubs**. Trees grow taller than shrubs. Plants like mango and coconut are trees. Bougainvillea, hibiscus and rose are shrubs.

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5

4 Discussion for findings (20 min.)

- Ask each group to present the findings from their activity.
- Write down students' findings in the table on the blackboard.
- Confirm the findings with students.
- **Based on their findings,** ask question as discussion points:

Q:What characteristics does the stem of the plant on the left have? (It is strong, thick, bigger, hard, etc.)

Q:What characteristics does the stem of the plant on the right have? (It is soft, thin, green, smaller, etc.)

Q:How can we group plants based on stems? (We can group plants based on the size, colour and hardness of stems.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the board.
- Ask the following questions as assessment:

  Q:What kinds of stems are there?

  Q:How can we group the stems?

  Q:What are the characteristics of herbs, trees and shrubs?

  Q:What are some examples of herbs, trees and shrubs.
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"How to group Plants: Stems"

Key question

How can plants be grouped by their stems?

Activity

comparing stems

How are they alike	How are they different
It is connected to roots.	Colour is different
It supports itself	Hardness is different.
etc	Size is different, etc

Discussion

Q: What characteristics does the stem of the plant on the left have?

It is strong, thick, bigger, hard, etc.

Q: What characteristics does the stem of the plant on the right have?

It is soft, thin, green, smaller, etc

Q: How can we group plants based on stems?

We can group plants based on the size, colour and hardness of stems.

Summary

- Plants can be grouped into herbs, trees and shrubs by their stems.
- We can group stems by their colour, hardness, and size.
  1. Herbs: Plants with soft and green stems
     e.g. tomato, rice, and potato
  2. Shrubs: Plants with hard woody stems
     e.g. roses, bougainvillea, etc
  3. Trees: Plants with hard woody stems taller than shrubs
     e.g. mango tree, coconut tree, etc

Unit	Chapter : **3. Characteristics of Plants**	Total lesson No: 33 / 94
Plants	Topic : **3.2. Grouping Plants**	Textbook page: 79 - 80

Lesson 7 / 9

Lesson Title

How to Group Plants: Leaves

Preparation

- Different types of leaves

Lesson Flow

1 Introduction (10 min.)

- Review the last lesson:

Q:What kinds of stem are there?

Q:How can we group stems?

- Motivate students to think about how to group plants by their stems and ask:

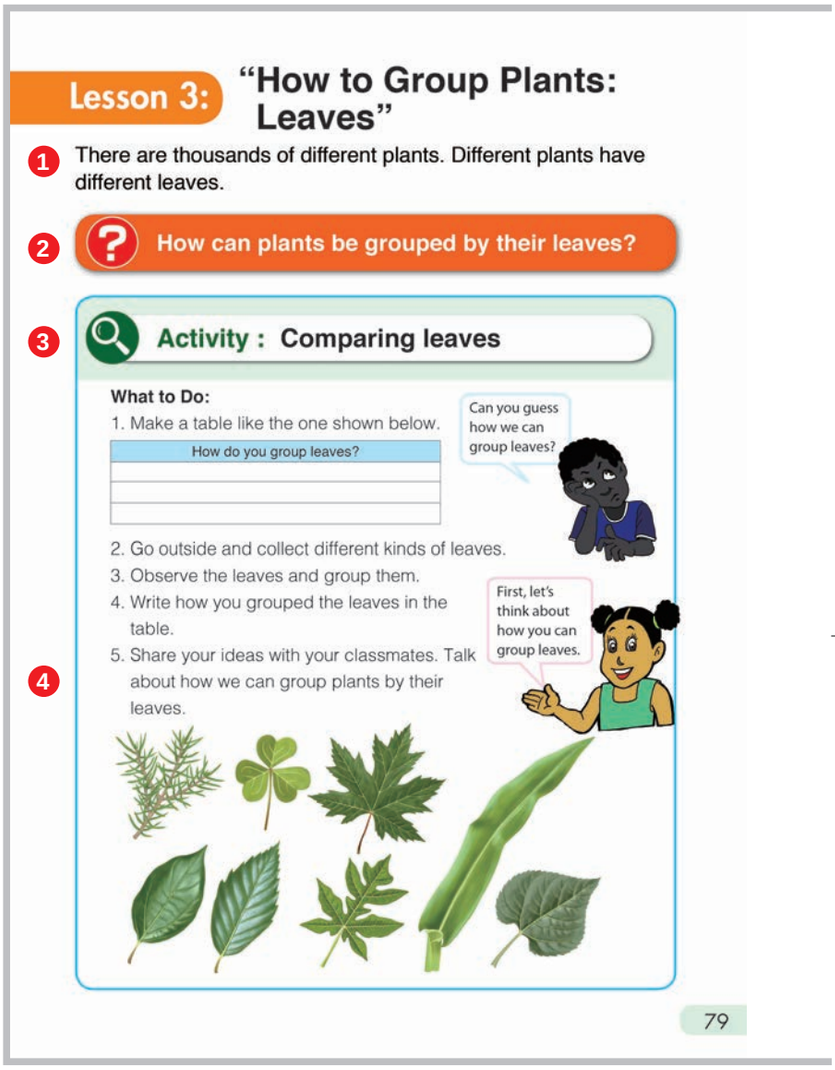
Q:Plants can be grouped by the roots and stems.Can we also group plants based on the leaves?

2 Introduce the key question

How can plants be grouped by their leaves?

3 Activity (20 min.)

- Explain the ground rules for outside activity.
- Have students go outside and collect the different kinds of leaves as many as possible.
- After that organise students into some groups and explain the steps of the activity.
- Let students predict how to group leaves.
- Have students do the activity based on their prediction and ask them to record their findings in their exercise book.
- After that, ask students to discuss how plants can be grouped by their leaves based on their findings in a group.



Lesson 3: "How to Group Plants: Leaves"

1 There are thousands of different plants. Different plants have different leaves.

2 How can plants be grouped by their leaves?

3 Activity : Comparing leaves

What to Do:

1. Make a table like the one shown below.

How do you group leaves?

Can you guess how we can group leaves?

2. Go outside and collect different kinds of leaves.
3. Observe the leaves and group them.
4. Write how you grouped the leaves in the table.
5. Share your ideas with your classmates. Talk about how we can group plants by their leaves.

4 First, let's think about how you can group leaves.

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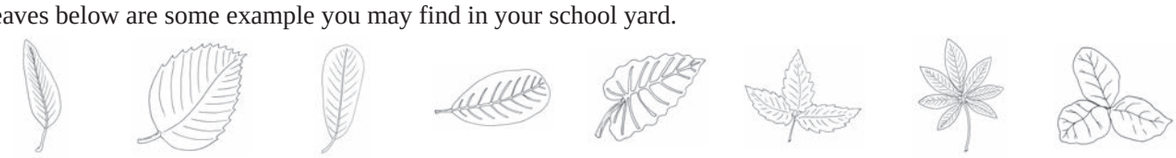
Teacher's Notes

Facilitation Guide

- Variety of leaves enriches the activity. Teachers are requested to encourage students to collect various types of leaves within a limited time. It is highly recommended for teachers to check leaves around your classroom prior to the lesson for smooth facilitation.
- Leaves below are some example you may find in your school yard.



Mango Hibiscus Frangipani Galip nuts Taro Tomato Cassava Bean

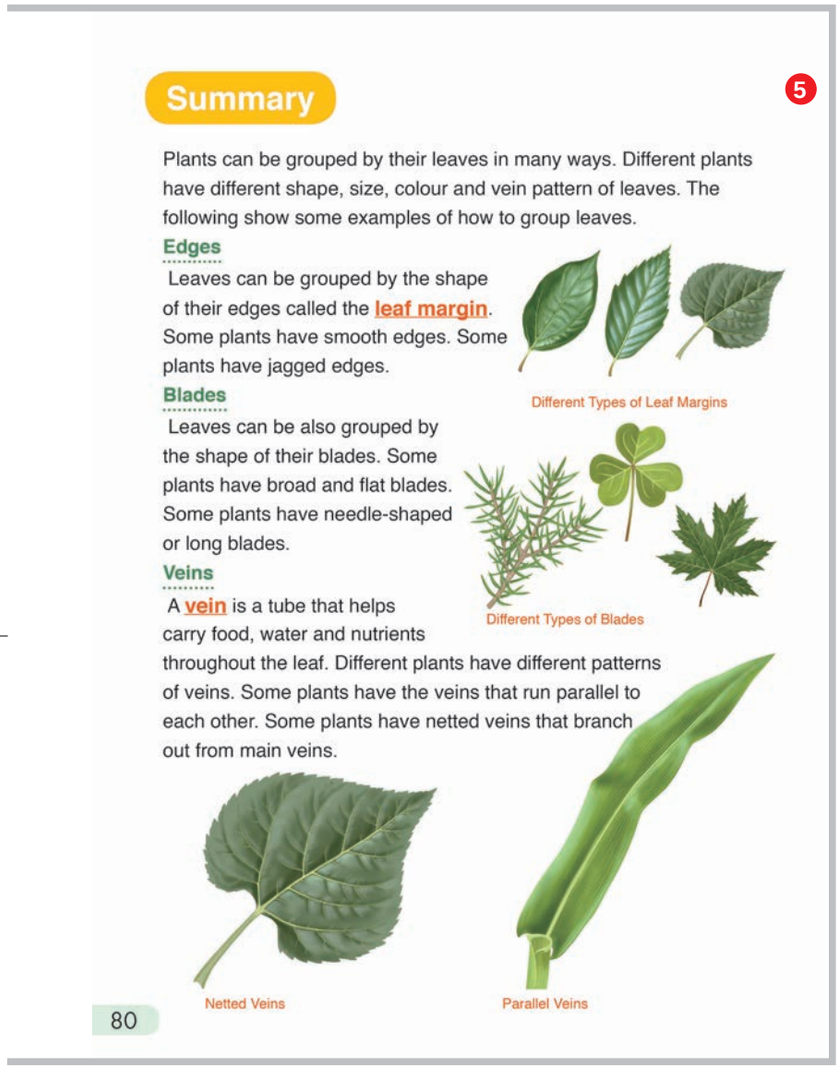
- Through this activity, students will learn the various ways of classification. Teachers should not limit the classification for only a few patterns but encourage them to discover various classification patterns.

Lesson Objectives

Students will be able to:
- Classify plants based on the leaves.
- Compare the properties of leaves.

Assessment

Students are able to:
- Identify the different properties of leaves.
- Describe how to group leaves based on their shape, size, colour and vein pattern.
- Listen to other's opinions with respect.



Summary

5

Plants can be grouped by their leaves in many ways. Different plants have different shape, size, colour and vein pattern of leaves. The following show some examples of how to group leaves.

Edges

Leaves can be grouped by the shape of their edges called the **leaf margin**. Some plants have smooth edges. Some plants have jagged edges.

Different Types of Leaf Margins

Blades

Leaves can be also grouped by the shape of their blades. Some plants have broad and flat blades. Some plants have needle-shaped or long blades.

Different Types of Blades

Veins

A **vein** is a tube that helps carry food, water and nutrients throughout the leaf. Different plants have different patterns of veins. Some plants have the veins that run parallel to each other. Some plants have netted veins that branch out from main veins.

Netted Veins

Parallel Veins

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4 Discussion for findings (20 min.)

- Ask students to present how they grouped leaves.
- Write down students' findings in the table on the blackboard.
- Confirm the findings with students.
- **Based on their findings,** ask the following questions as discussion points.

Q:What properties did you use when you grouped leaves? (Size, colour, shape, texture, smell, etc.)

Q:Which parts of leaves look different or alike? (Edges, blade, veins, etc.)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on a black board.
- Ask the following questions as assessment:
  Q:What is a leaf margin?
  Q: What is the meaning of vein?
  Q: Give some examples of how to group leaves.
  Q: How can we group plants based on veins?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

"How to group Plants: Leaves"

Key question

Q: How can plants be grouped by their leaves?

Activity

Comparing leaves

How do group leaves?
Thin, thick, round
Size. Softness
Texture, smell
Hardness
Colour

Discussion

Q: What properties did you use when you grouped leaves?

Size, colour, shape, texture, smell, etc

Q: Which parts of leaves look different or alike?

Edges, blade, veins, etc

Summary

- Plant leaves can be grouped by their properties in many ways such as shape, size colour, texture and smell.

- Examples of how to group leaves:
- Edges:
  An edge is called a leaf margin.
  Leaves can be grouped by the shape of their edges.
- Blades:
  Leaves can be grouped by the shape of their blade.
- Veins:
  A vein is a tube that can help carry food, water, and nutrients throughout the leaf.
  Some plants have the parallel veins.
  Some plants have netted veins

Unit	Chapter : **3. Characteristics of Plants**	Total lesson No: 34 / 94
Plants	Topic : **3.2 Grouping Plants**	Textbook page: 81 - 83

Lesson 8 / 9

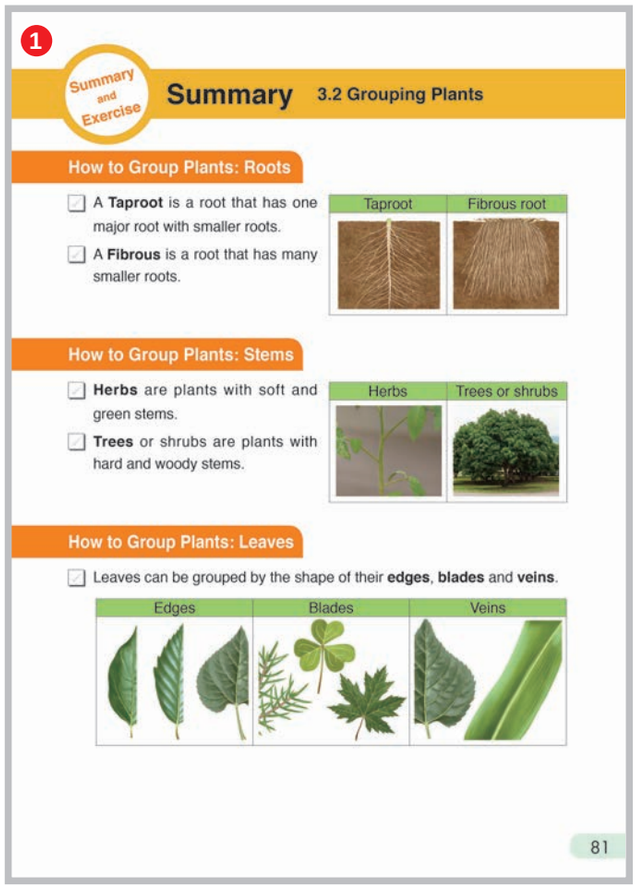
Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (20 min.)

- Recap main learning contents in this topic
- Ask some focus questions to students and verify student understanding on;
  - How can we group plants?
  - How are plants be grouped by their stems?
  - What are three ways to group plants by their leaves?
- Explain the correct learning contents again if they still have misconceptions.
- Provoke students to give some examples of characteristics of plants that can be used to group plants.
- Ask students to describe some of these characteristics of plants.



1

Summary and Exercise

Summary 3.2 Grouping Plants

How to Group Plants: Roots

- A **Taproot** is a root that has one major root with smaller roots.
- A **Fibrous** is a root that has many smaller roots.

Taproot | Fibrous root

How to Group Plants: Stems

- **Herbs** are plants with soft and green stems.
- **Trees** or shrubs are plants with hard and woody stems.

Herbs | Trees or shrubs

How to Group Plants: Leaves

- Leaves can be grouped by the shape of their **edges**, **blades** and **veins**.

Edges | Blades | Veins

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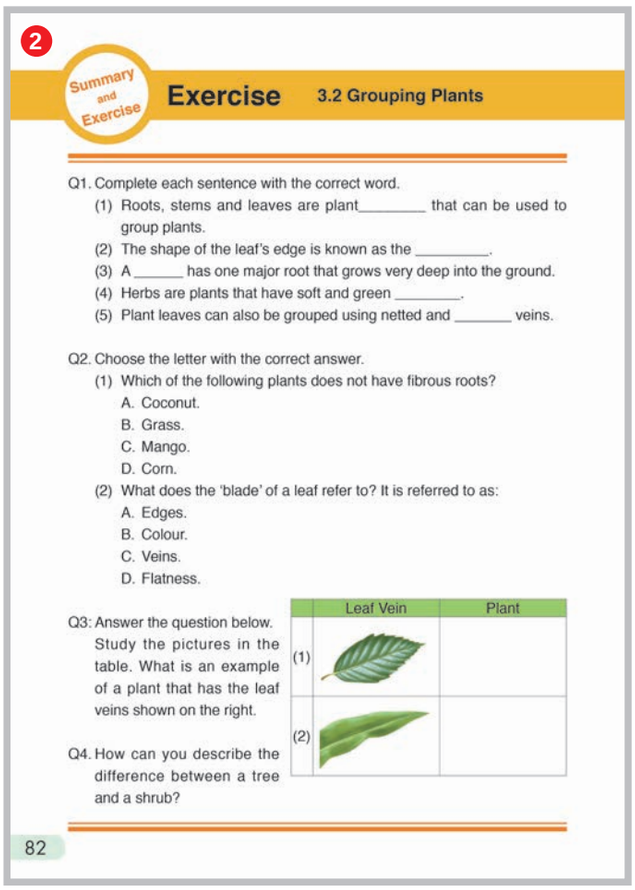
2 Exercise & Explanation (30 min.)

- Explain to students that they will have to answer all the parts of four (4) questions in the exercise even if they are not completely sure of the answer(s).
- Allow student to try answering questions individually with enough time to respond.
- After the exercise, use student's answers to answer the questions.
- Explain how to solve the answer using the students' thoughts.



2

Summary and Exercise

Exercise 3.2 Grouping Plants

Q1. Complete each sentence with the correct word.

(1) Roots, stems and leaves are plant_____ that can be used to group plants.
(2) The shape of the leaf's edge is known as the _____.
(3) A _____ has one major root that grows very deep into the ground.
(4) Herbs are plants that have soft and green _____.
(5) Plant leaves can also be grouped using netted and _____ veins.

Q2. Choose the letter with the correct answer.

(1) Which of the following plants does not have fibrous roots?
A. Coconut.
B. Grass.
C. Mango.
D. Corn.

(2) What does the 'blade' of a leaf refer to? It is referred to as:
A. Edges.
B. Colour.
C. Veins.
D. Flatness.

Q3: Answer the question below. Study the pictures in the table. What is an example of a plant that has the leaf veins shown on the right.

	Leaf Vein	Plant
(1)		
(2)		

Q4. How can you describe the difference between a tree and a shrub?

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Exercise answers

Q1.
(1) **parts**
(2) **margin**
(3) **taproot**
(4) **stem**
(5) **parallel**

(1) Scientist use plants characteristics like the roots, stems and leaves to classify plants.
(2) The shaped edges of a leaf is known as the margin.
(5) When leaves are grouped by their veins, there will be two groups –netted and parallel veins.

Q2.
(1) **C**
(2) **D**

(1) Mango has taproot while the others have fibrous roots.
(2) The flatness or broadness of the leaf is known as the blade.

Q3.
Examples of the answers:
(1) **Mango, guava, crotton, hibiscus, rain tree, rose, bougainvillea**
(2) **Grass, corn, lily, bamboo, coconut, betelnut, oil palm**

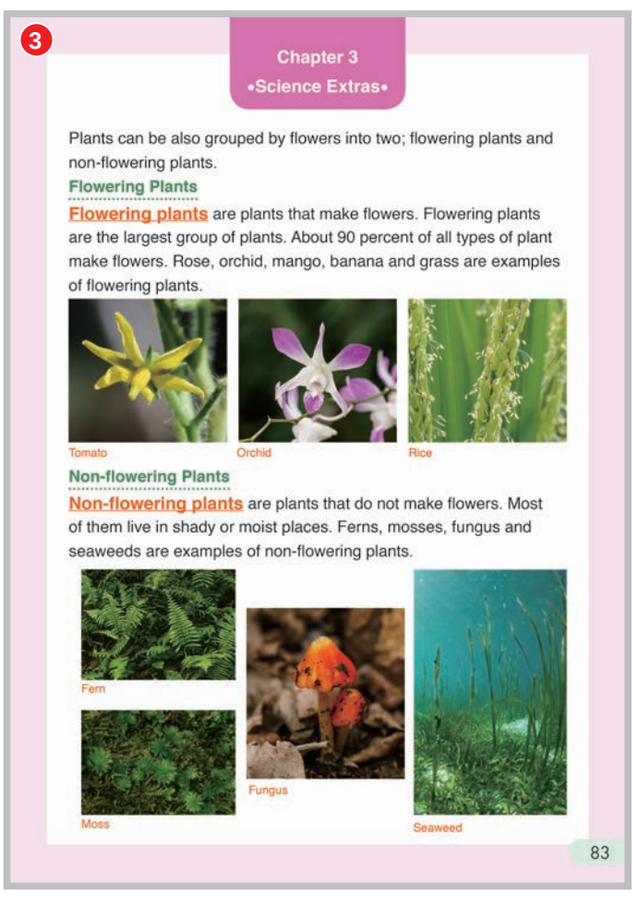
(1) All these plants have netted veins.
(2) All these plants have parallel veins.

Q4.
Example of the answers:
- **A tree is bigger than shrub.**
- **A shrub is smaller than a tree.**
- **A tree is big like a mango and shrub is small like a rose.**
- **A tree is bigger than shrub. An example of a tree is the mango and an example of the shrub is a rose.**

Explanation of Science Extras

3 Science Extras (10 min.)

- Give opportunities to students to closely observe the nature and its phenomena in the world.
- Allow students to ask questions that demonstrate curiosity about the content in the column.


3

Chapter 3
•Science Extras•

Plants can be also grouped by flowers into two; flowering plants and non-flowering plants.

Flowering Plants

Flowering plants are plants that make flowers. Flowering plants are the largest group of plants. About 90 percent of all types of plant make flowers. Rose, orchid, mango, banana and grass are examples of flowering plants.

Tomato Orchid Rice

Non-flowering Plants

Non-flowering plants are plants that do not make flowers. Most of them live in shady or moist places. Ferns, mosses, fungus and seaweeds are examples of non-flowering plants.

Fern Fungus Moss Seaweed

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Lesson
9 / 9

Lesson Title

Chapter Test

Answer of the Chapter Test

Chapter Test

3. Characteristics of Plants

Q1 Complete each sentence with the correct word.

(1) Most plants have the same parts in common; roots,leaves, flowers and _____stem_____

(2) _____Leaves_____ are part of a plant that makes food for the plants to grow by taking light energy from the sun.

(3) A _____fibrous root_____ is a root that has many smaller roots that branch out in different directions.

Q2 Choose the letter with the correct answer.

(1) Which part of a plant carries water and nutrients from the roots to the other parts of the plant?

A. vein (B.) stem C. leaf D. flower

(2) Which of the following plants has fibrous roots?

A. bean	B. carrots	(C.) onion
		

(3) Which of the statements is true about herbs, shrubs and trees?

A. Herbs have hard woody stems while shrubs and trees have soft green stems.

(B.) Herbs have soft green stems while shrubs and trees have hard woody stems.

C. Herbs and shrubs have small woody stems while trees have large woody stems.

D. Herbs have soft woody stems while shrubs and trees have hard woody stems.

(4) Which statement is <u>not</u> true about different places where plants grow?

(A.) No plants grow in sea because of salt.

B. Plants can obtain enough sun light in sunny places.

C. Many plants grow on the ground in sunny places.

D. Moss and fern grow in shady and moist places because they need enough water.

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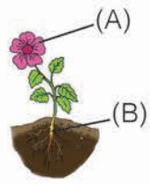
Q3

(1) A white flowered plant is placed into the red water as shown in the picture. What colour will the flowers be after 7 hours? Explain why.

The flower color changed to orange color, because stem of plant carries orange water to flower.

(2) Look at the plant picture on the right. Name and state the function of the part of plant A and B.



A. Name Flower, which makes seeds to increase new plants.
Function

B. Name Roots, which takes in water and nutrients from
Function soil, and hold the plant in the soil.

(3) Look at the picture of a plant leaf on the right. What do we call the type of veins in the picture?

Netted Veins

Q4

(1) A part of a plant is removed as shown by the following pictures. Which of them is most likely to survive? State with your reason.

Without leaves	Without Flower	Without Roots	Without Stem
			

Plant without flower is the most likely to survive. If plants do not have leaves, stem and roots, they cannot make foods, take in water/nutrition, and carry these important things to whole parts of the plant.

(2) Give an example of herbs and trees or shrubs found in your school, garden or at home.

Herb: Tomato, Cucumber, Onion, Banana, Corn, Grass etc

Tree or Shrub: Lemon, Guava, Hibiscus, Bougainvilea, Mango, Papaya, Pine etc

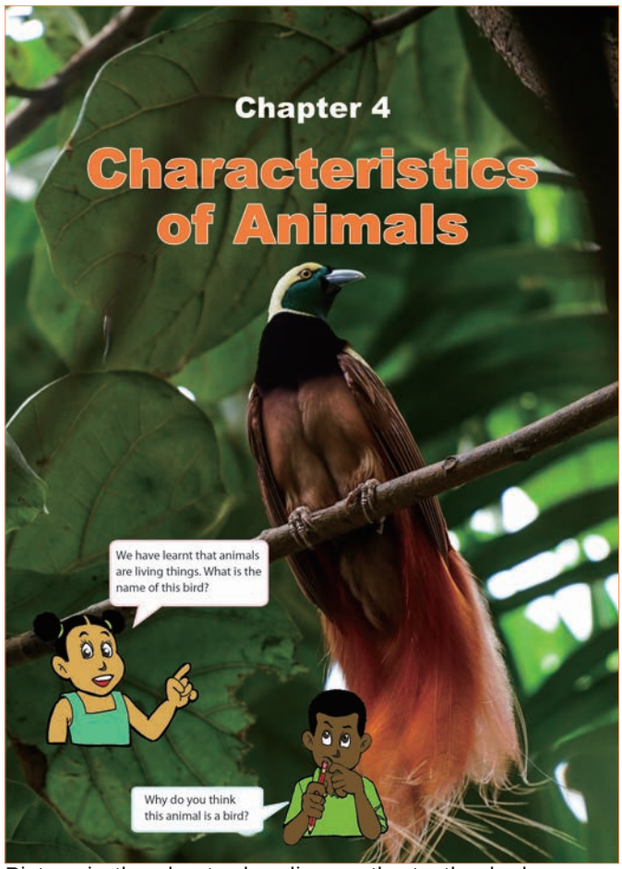
Strand : LIFE
Unit : ANIMALS

Chapter 4. Characteristics of Animals

Chapter Objectives

Students will be able to understand the characteristics of animals that are used to group animals into insects, fish, amphibians, reptiles, birds and mammals.

Students will be able to also observe animals and classify them into the groups according to the common characteristics of each animal group.



Picture in the chapter heading on the textbook shows our national bird, 'Raggiana bird of paradise'.

Topic Objectives

4.1 Observing Animals

Students will be able to;

- Name the six animal groups; insects, fish, amphibians, reptiles, birds and mammals.
- Describe common characteristics of each animal group; insects, fish, amphibians, reptiles, birds and mammals.
- Identify how animals use their body parts for moving, protecting and using their senses.

Related Learning Content

The learning contents in this chapter connect to the following chapters.

Grade 3
- Observing Our Environment

Prerequisite knowlege learnt in previous lessons;
- Animals are living things.
- Animals needs air, water and food to survive.
- Different animals live and grow in the different environment.

Grade 3
- Characteristics of Animal

→ **Grade 4**
- Life Cycle Of Animals

→ **Grade 5**
- Reproduction and Heredity in Animals

→ **Grade 6**
- Human Body System

Teaching Overview

This chapter consists of 10 lessons, each lesson is a double period.

Topic	Lesson No.	Lesson Title and Key Question	Content standard in syllabus	Textbook page number
4.1 Observing Animals	1	**Animal Groups** How can animals be grouped?	3.1.2	87 - 88
	2	**Observing Insects** What common characteristics do insects have?		89 - 90
	3	**Observing Fish** What characteristics do fish have in common?		91 - 92
	4	**Observing Amphibians** What characteristics do amphibians have in common?		93 - 94
	5	**Observing Reptiles** What characteristics do reptiles have in common?		95 - 96
	6	**Observing Birds** What characteristics do birds have in common?		97 - 98
	7	**Observing Mammals** What characteristics do mammals have in common?		99 - 100
	8	**Animal Body Parts and Their Uses** How do animals use their body parts?		101 - 102
	9	Summary and Exercise		103 - 105
Chapter Test	10	Chapter Test		106 - 107

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 36 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 87 - 88

Lesson 1 / 10	**Lesson Title** **Animal Groups**

Preparation
Nil

Lesson Flow

1 Introduction (5 min.)

- Review the lessons in Topic 3-2: 'Grouping Plants':

Q:How can we group plants?

- Motivate students to think about how to group plants by their roots, stems and leaves and ask;

Q:Plants can be grouped by their roots, stems and leaves. Can we also group animals?

2 Introduce the key question

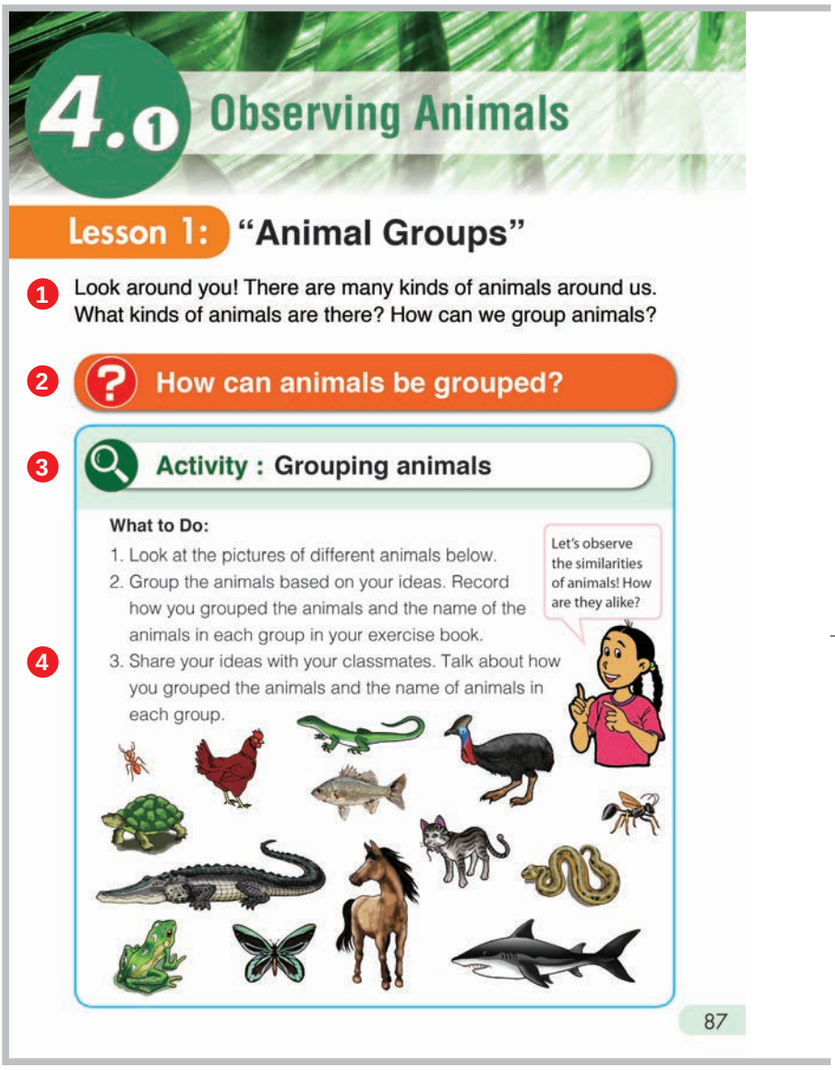
How can animals be grouped?

3 Activity (20 min.)

- Organise students into some groups.
- Explain the steps of the activity.
- Identify the names of animals in the pictures with students.
- Have students do the activity and ask them to record their ideas in their exercise book.
- Advise students to refer to the character's talking for their investigation.
- After that, ask students to discuss how they grouped animals based on their findings in a group.

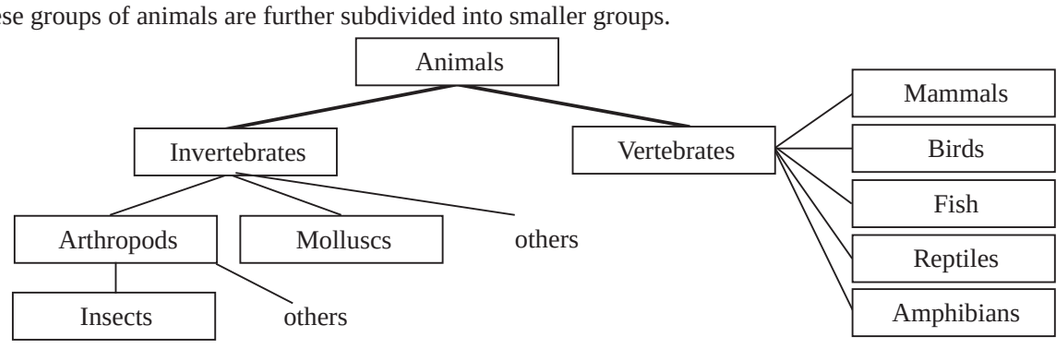
4 Discussion for findings (25 min)

- Ask students to present their ideas. (Continue)



Teacher's Notes

Animals can be grouped into **vertebrates** and **invertebrates**.
Vertebrates are animals with **backbones**. Invertebrates are animals **without backbones**.
These groups of animals are further subdivided into smaller groups.

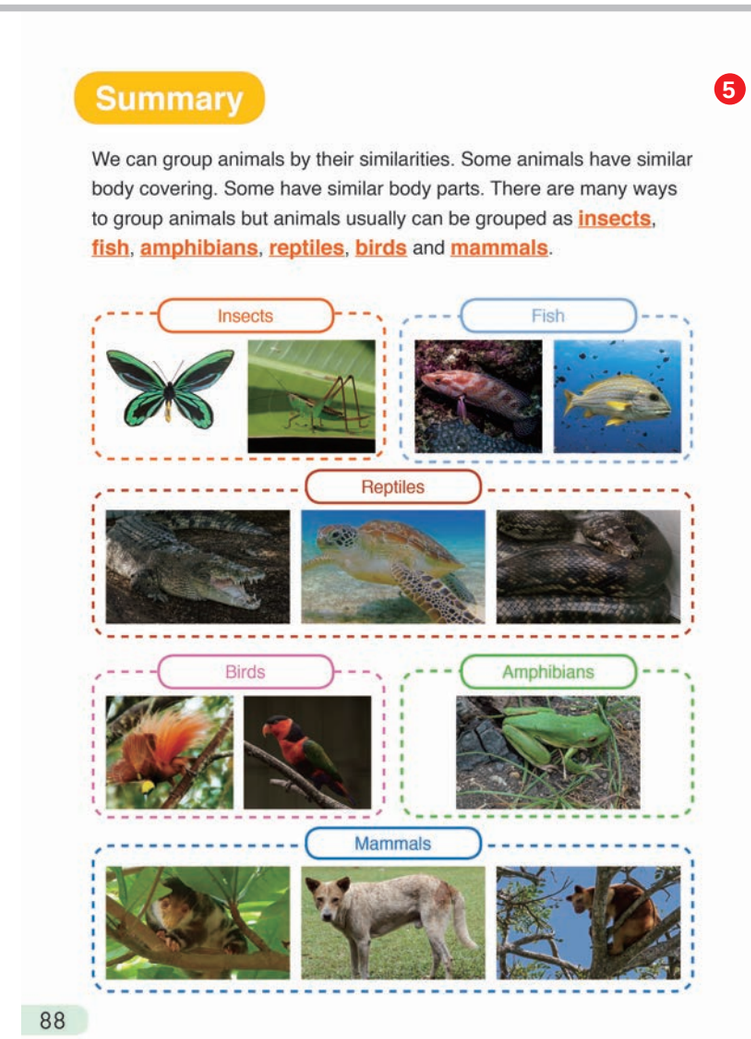


Lesson Objectives

Students will be able to:
- Classify the animals based on their characteristics.
- Describe how to classify animals.

Assessment

Students are able to:
- Group animals into insects, fish amphibians, reptiles, birds and mammals as animal groups.
- Explain how animals are alike or different.
- Co-operate in groups to find animals in their surroundings



- Write down their ideas on the blackboard.
- Facilitate active students' discussion.
- Confirm the ideas with students.
- **Based on their ideas,** ask the following questions as discussion point.

Q:How many animal groups did you find? (It depends.)

Q:What did you base the groups on? (The number of legs, it can fly or not, it lives on land or in water, etc)

- Ask students to open their text book and explain how to group animals and different animal groups.
- Ask the question:

Q:How are the animals in each group similar? (It depends.)

- Have students group the animals in the activity into insects, fish, amphibians, reptiles, birds and mammals.
- Confirm their findings and conclude the discussion

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson.
- Ask the following questions as assessment:
  Q: What kinds of animal groups are there?
  Q: How can animals be grouped?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title:

Animal Groups"

Key question

How can animals be grouped?

Activity

Grouping animals

	Name of animals
Group 1	Bee, butterfly, chicken
Group 2	Tilapia, shark
Group 3	Lizard, frog, crocodile
Group 4	Others, etc

Discussion

Q: How many animal groups did you find?
It depends on students' ideas.

Q: What did you base the groups on? The number of legs, it can fly or not, it lives on land or in water, etc

Q: How are the animals in each group similar?

Groups	Animals
insects	Six legs, can fly, etc.
Fish	No leg, fins, swim, etc
Reptiles	4 legs, scale, live on land
Birds	Fly, 2 legs, beak, etc
Amphibians	live in water and land, etc
Mammals	Fur, 4 legs, etc

Groups	Animals
insects	ant, bee, butterfly
Fish	tilapia, shark
Reptiles	snake, lizard, crocodile, turtle
Birds	chicken,
Amphibians	frog
Mammals	cat, horse

Summary

- Animals can be grouped by how they are alike.
- Usually, animals are grouped as insects, fish, amphibians, reptiles, birds and mammals.
- Each animal group has the similar characteristics.

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 37 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 89 - 90

Lesson 2 / 10

Lesson Title

Observing Insects

Preparation

- Nil

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson:

Q:What kinds of animal groups are there?

Q:How can we group animals?

- Encourage students to think about the characteristics of insects by asking:

Q:Insects are one of the animal groups. What characteristics do insects have?

2 Introduce the key question

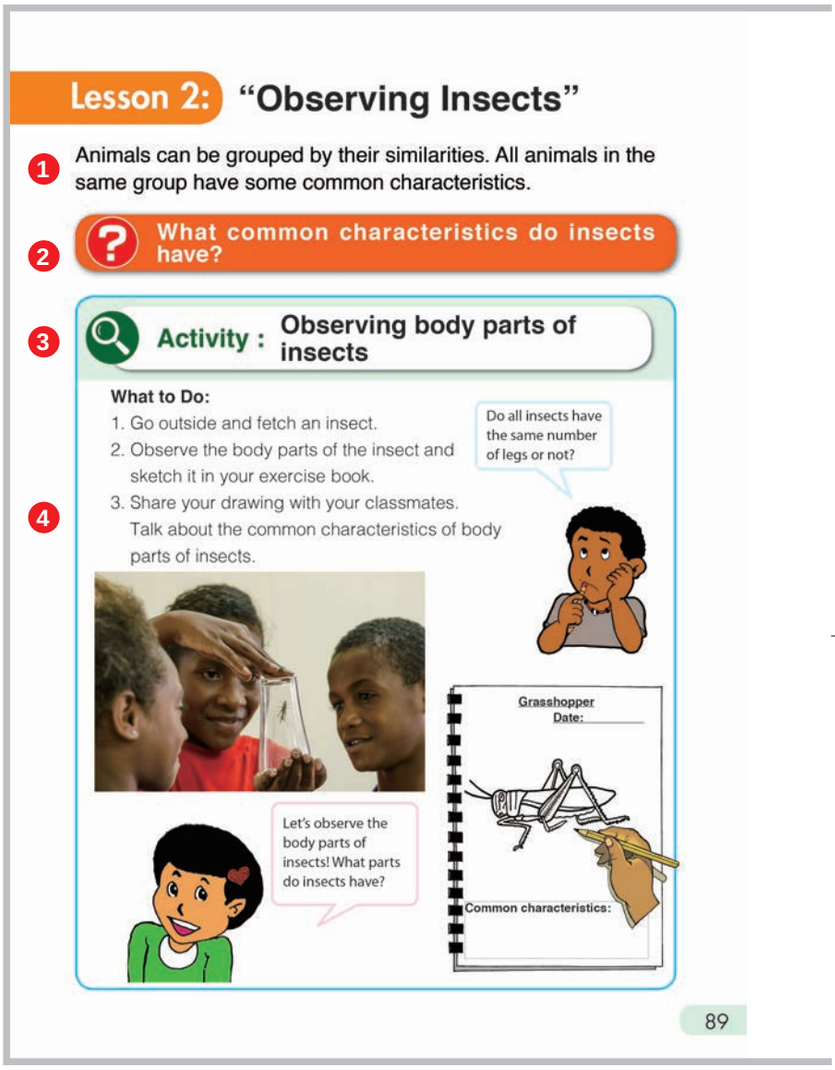
What common characteristics do insects have?

3 Activity (20 min.)

- Organise students into some groups.
- Explain the steps of the activity
- Remind students of safety rules
- Let students go outside with a jar and collect insects in the jar.
- Have students observe and sketch the insects.
- Instruct students to pay attention to the body parts when they draw the insects.
- Ask students to share their drawings and discuss the body parts of the insects.

4 Discussion for findings (15 min.)

- Ask each group to present their drawings and the body parts of the insects they found. (Continue)



Lesson 2: "Observing Insects"

1 Animals can be grouped by their similarities. All animals in the same group have some common characteristics.

2 What common characteristics do insects have?

3 Activity : Observing body parts of insects

What to Do:

1. Go outside and fetch an insect.
2. Observe the body parts of the insect and sketch it in your exercise book.
3. Share your drawing with your classmates. Talk about the common characteristics of body parts of insects.

4

Do all insects have the same number of legs or not?

Let's observe the body parts of insects! What parts do insects have?

Grasshopper
Date:

Common characteristics:

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Teacher's Notes

⚠ Caution: Some insects bite and sting, they should not be touched.
Below shows how to make and use quick trap made of plastic bottle to capture insects. Teachers should prepare and fix them one day before the lesson so that students can easily find insects within the given time.

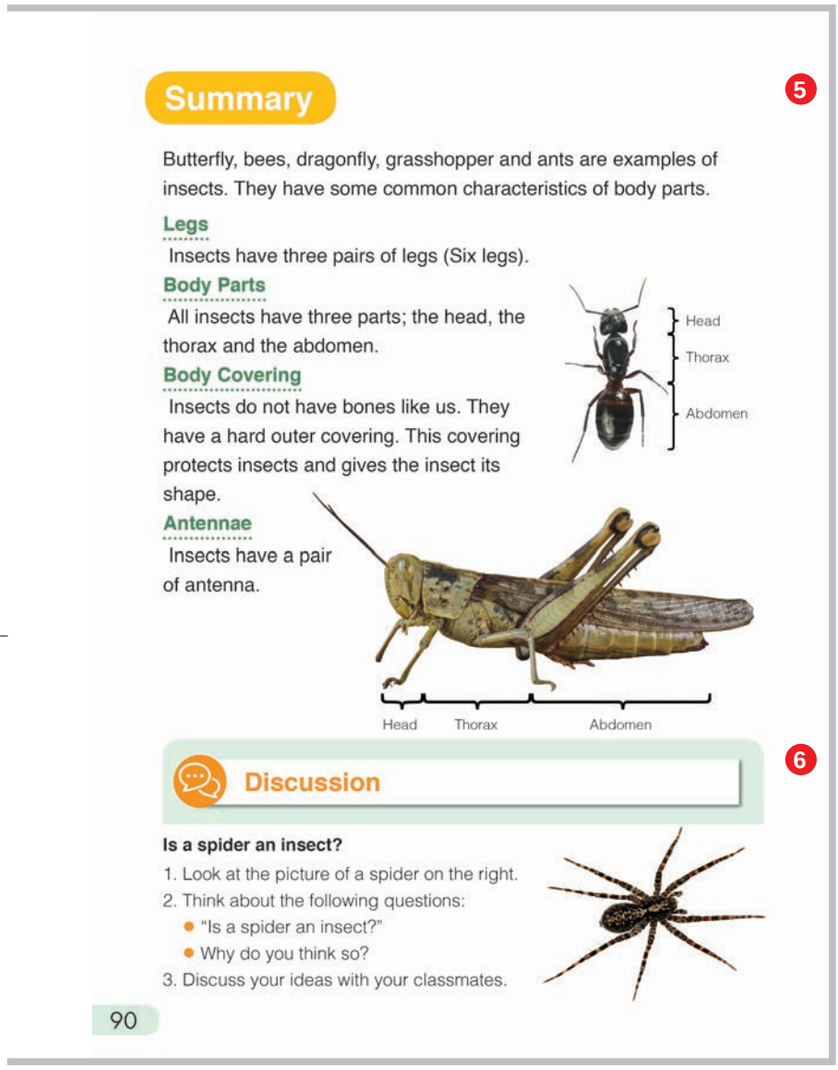
- Use glass bottle, transparent plastic container or plastic bottle to keep insects for observation.
- Insects move and thus it may be difficult for students to observe. Using dead insects is good alternative.
- As described in teacher's note for topic "observing plants" scientific sketch is NOT an artwork. You much draw what you see. If you find the sample insect you catch misses one leg, you cannot add the missing leg, because it is different from the fact.

Lesson Objectives

Students will be able to:
- Identify the common characteristics of insects.
- Observe the common body parts of insects.

Assessment

Students are able to:
- Describe the common characteristics of insects such as legs, antennae, body covering and body parts.
- Illustrate the outline of insects with their parts labelled.
- Investigate the parts of insects with interest.



Summary 5

Butterfly, bees, dragonfly, grasshopper and ants are examples of insects. They have some common characteristics of body parts.

Legs
Insects have three pairs of legs (Six legs).

Body Parts
All insects have three parts; the head, the thorax and the abdomen.

Body Covering
Insects do not have bones like us. They have a hard outer covering. This covering protects insects and gives the insect its shape.

Antennae
Insects have a pair of antenna.

Discussion 6

Is a spider an insect?
1. Look at the picture of a spider on the right.
2. Think about the following questions:
   - "Is a spider an insect?"
   - Why do you think so?
3. Discuss your ideas with your classmates.

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- Write down students' findings on the blackboard.
- Confirm the findings with students.
- **Based on their observation,** ask the following questions:,

Q:What kinds of the body parts did you find? (Legs, wings, head, thorax, abdomen, antenna, etc)

Q:How many legs, bodies and antennas does the insect you observed have? (It has 6 legs, 3 body parts, and 2 antennas.)

Q:What body parts do the insects have in common? (6 Legs, 3 body parts, and 2 antennas)

- Conclude the discussion.

5 Summary (5 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarize today's lesson on the blackboard.
- Ask the following questions as assessment:
  Q:What are the common characteristics of insects?
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion(5 min.)

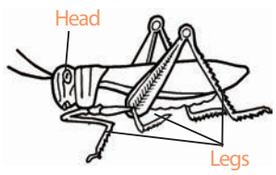
- Let students think about the questions in 'Discussion' in groups.
- Ask each group to present their answers and confirm them with students.
- Conclude the further discussion

Sample Blackboard Plan

Title:
"Observing Insects"

Key question
What common characteristics do insects have?

Activity Observing body parts of insects



Discussion
Q: What kinds of the body parts did you find?
Legs, wings, head, thorax, abdomen, antenna, etc
Q: How many legs, bodies, and antennas does the insect you observed have?
It has 6 legs, 3 body parts, and 2 antennae.
Q: What body parts do the insects have in common?
6 Legs, 3 body parts, and 2 antennae

Summary
- Insects have some common characteristics:
  - 6 legs
  - 2 antennae
  - 3 body parts (head, thorax, abdomen)
  - Hard outer body covering
- Not all insects have wings e.g. An ant

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 38 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 91 - 92

Lesson 3 / 10

Lesson Title

Observing Fish

Preparation

- A real fish
- Pictures of fish, hand lens,

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson:

Q:What are the common characteristics of insects?

- Encourage students to think about the characteristics of fish by asking:

Q:Insects have some similar characteristics. What about fish?

2 Introduce the key question

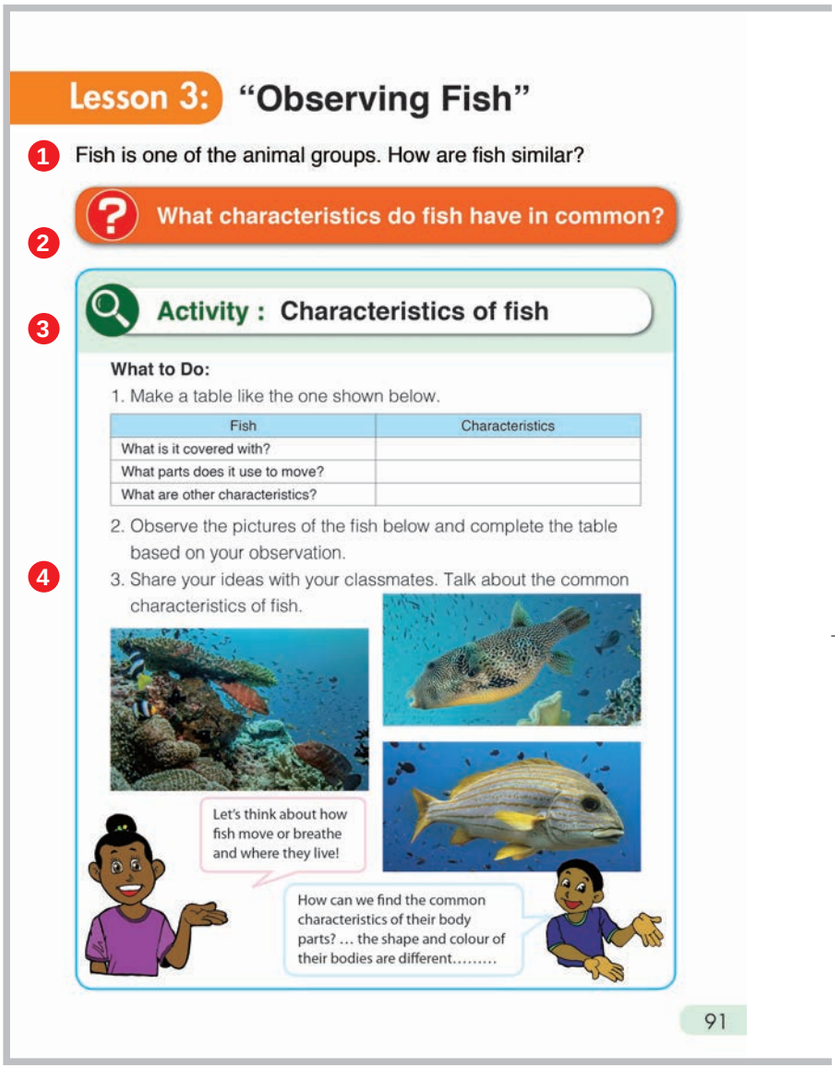
What characteristics do fish have in common?

3 Activity (25 min.)

- Organise students into groups .
- Explain the steps of the activity.
- Have students to do the activity and ask them to record their findings in the table.
- Refer students to the pictures of the fish and the characters' talking in the activity for their investigation..
- If possible, prepare different kinds of real fish for this activity.
- Ask students to discuss the common characteristics of fish based on their findings in their groups

4 Discussion for findings (20 min.)

- Ask each group to present their findings about the common characteristics of fish. (Continue)



Lesson 3: "Observing Fish"

1 Fish is one of the animal groups. How are fish similar?

2 What characteristics do fish have in common?

3 Activity : Characteristics of fish

What to Do:

1. Make a table like the one shown below.

Fish	Characteristics
What is it covered with?	
What parts does it use to move?	
What are other characteristics?	

2. Observe the pictures of the fish below and complete the table based on your observation.

4 3. Share your ideas with your classmates. Talk about the common characteristics of fish.

Let's think about how fish move or breathe and where they live!

How can we find the common characteristics of their body parts? ... the shape and colour of their bodies are different.....

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Teacher's Notes

Fish is a vertebrate animal and its characteristics are summarised as follows.

- Live in the water
- Mostly lay eggs (*)
- Have a backbone
- Cold-blooded
- Breathe through gills
- Mostly have scales
- Have fins

Example: sharks, salmon, tuna, rays

*Some fishes apparently give birth to live young. However, they actually lay eggs and retain the eggs inside the body until the hatch to avoid risks. They are called 'livebearers'.

Dolphins and whales

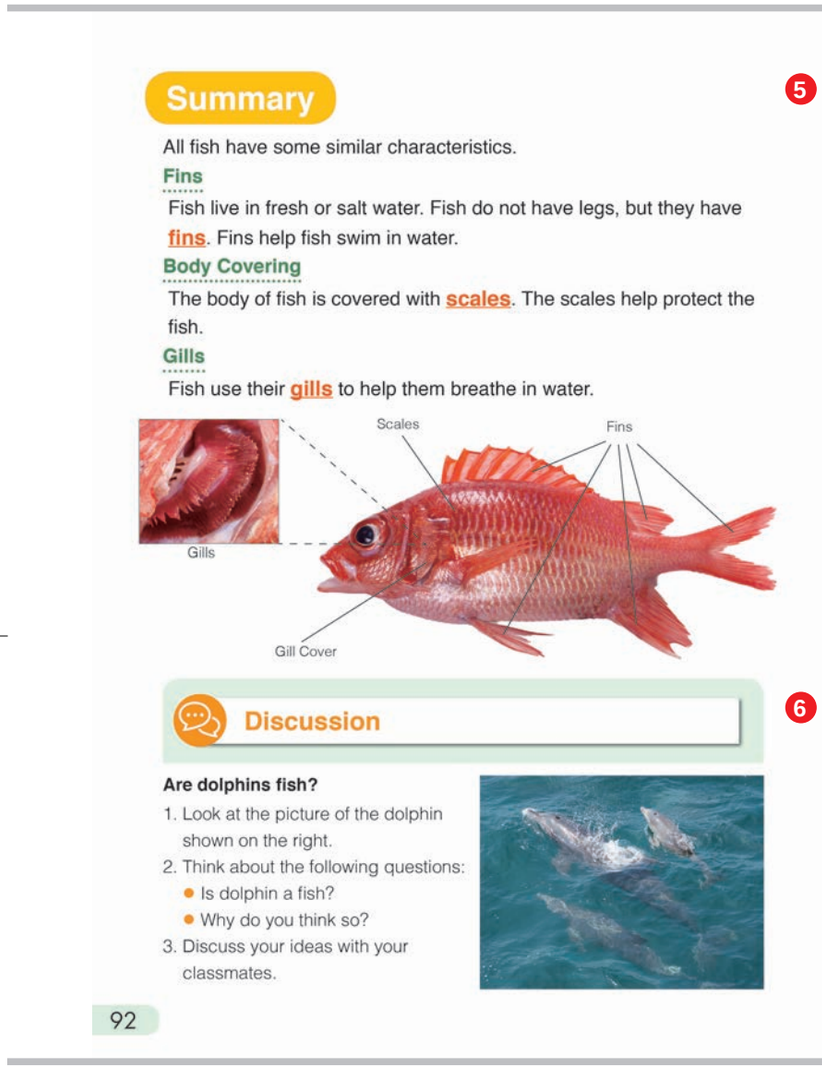
Dolphins and whales are vertebrate animals that also live in water. However, they don't lay eggs and give birth to live young. They have mammary glands which in females produce milk for feeding (nursing) their young. They are warm blooded. Unlike fish, who breathe through gills, they breathe air through their lungs. Therefore, dolphins and whales must make frequent trips to the surface of the water to catch a breath.

Lesson Objectives

Students will be able to:
- Identify the common characteristics of fish
- Explain the functions of common characteristics of body parts of fish

Assessment

Students are able to:
- Describe that fish has fins, scales and gills as the common characteristics
- State the functions of fins, scales and gills
- Participate actively in investigating the common characteristics of fish



Summary 5

All fish have some similar characteristics.

Fins

Fish live in fresh or salt water. Fish do not have legs, but they have **fins**. Fins help fish swim in water.

Body Covering

The body of fish is covered with **scales**. The scales help protect the fish.

Gills

Fish use their **gills** to help them breathe in water.

Discussion 6

Are dolphins fish?

1. Look at the picture of the dolphin shown on the right.
2. Think about the following questions:
   - Is dolphin a fish?
   - Why do you think so?
3. Discuss your ideas with your classmates.

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- Write down students' findings on the blackboard
- Confirm their findings with students.
- **Based on the findings,** ask the following questions.

Q:What body parts do fish have in common? (Fin, Scales, and Gills)

Q:Which part of the fish helps them to swim in water? (The fins)

Q:Which part of the fish helps them to breathe in water? (The gills)

Q:Which part of the fish helps to protect them? (The scales)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard.
- Ask the following questions:
  Q:What are the common characteristics of fish?
  Q:What are the functions of fins, gills and scales?
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion(5 min.)

- Let students think about the questions in 'Discussion' in their groups.
- Ask each group to present their answers and confirm them with students.
- Conclude the further discussion.

Sample Blackboard Plan

Title:

"Observing Fish

Key question

What characteristics do fish have in common?

Activity

Characteristics of Fish

	characteristics
What is it covered with?	Scales
What part does it use to swim?	Fins
Any other characteristics?	Fish has gills, no legs, no feather or fur, etc

Discussion

Q: What body parts do fish have in common?

Gills, scales and fins

Q: Which part of the fish helps them to swim in water?

The fins

Q: Which part of the fish helps them to breath in water?

The gills

Q: Which part of the fish helps to protect them?

The scales help to protect the fish.

Summary

- Fish have similar characteristics:
  - Fish live in fresh and salt water.
  - Fish use fins to swim in water.
  - A fish is covered with scales to protect its body.
  - Fish use gills to breathe in water.

Further Discussion

Q: Is dolphin a fish? No

Q: Why do you think so?

This is because the dolphin is not covered with scales, it cannot breathe in water.

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 39 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 93 - 94

Lesson 4 / 10

Lesson Title

Observing Amphibians

Preparation

- Live frog
- Pictures of frogs

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson:

Q:What are the common characteristics of fish?

- Arouse students to think about the characteristics of amphibians by asking:

Q:Fish have some similar characteristics. What about amphibians?

2 Introduce the key question

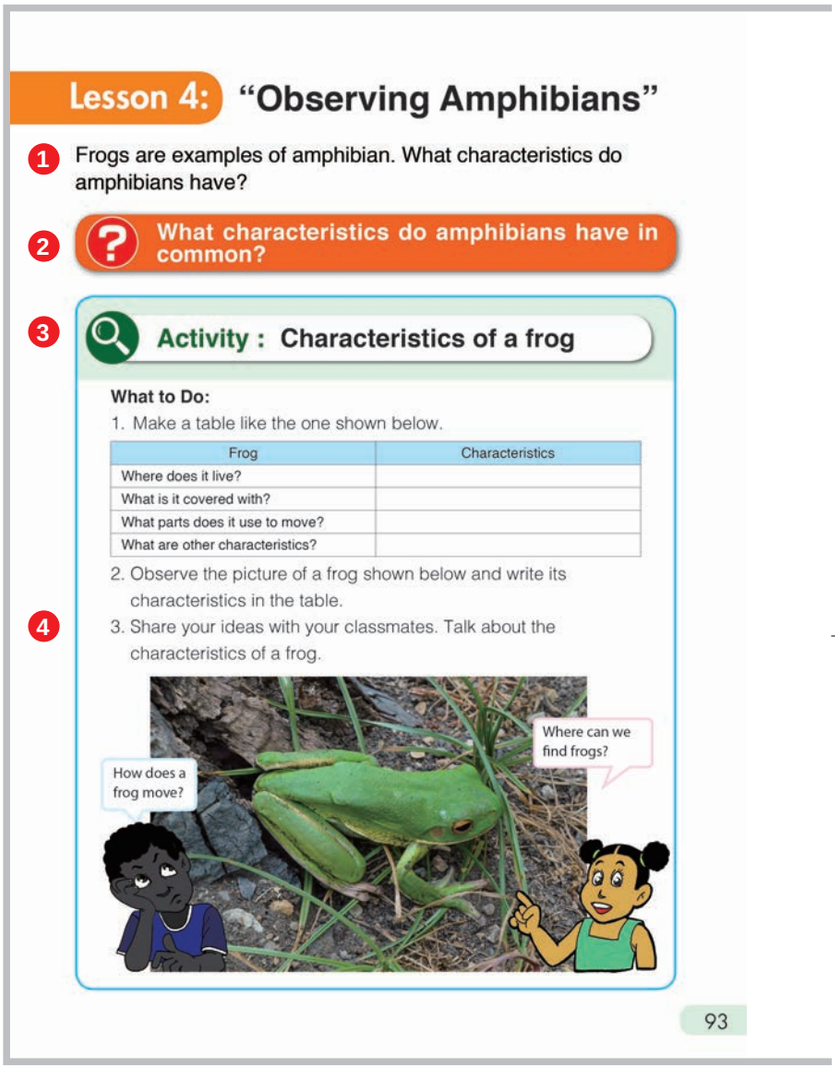
What characteristics do amphibians have in common?

3 Activity (25 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Have students do the activity and ask them to record their findings in the table.
- Refer students to the pictures of a frog and the characters' talking in the activity for their investigation.
- If possible, prepare different kinds of live frog (amphibians) for this activity.
- Ask students to discuss the characteristics of frog (amphibians) based on their findings.

4 Discussion for findings (20 min.)

- Ask students to present their findings from the activity (Continue).



Lesson 4: "Observing Amphibians"

1 Frogs are examples of amphibian. What characteristics do amphibians have?

2 What characteristics do amphibians have in common?

3 Activity : Characteristics of a frog

What to Do:

1. Make a table like the one shown below.

Frog	Characteristics
Where does it live?	
What is it covered with?	
What parts does it use to move?	
What are other characteristics?	

2. Observe the picture of a frog shown below and write its characteristics in the table.

4 3. Share your ideas with your classmates. Talk about the characteristics of a frog.

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Teacher's Notes

- Amphibians are cold-blooded vertebrates. They live part of their lives in water and on land.
- Amphibians absorb water and undergo gas exchange through their skin.

Examples of amphibians

- common toad - Tailless nocturnal insectivorous amphibian usually found on land and not very adept at jumping; its body is covered with small outgrowths.
- Newt - Amphibian with a flat tail found mainly in freshwater and usually feeds on insects.
- Salamander- Nocturnal amphibian, mainly insectivorous, with a tail; they are land and aquatic species.
- Tree Frog- Small tailless, usually insectivorous amphibian found mostly in trees near water; its digits are fitted with suction cups.

⚠ Caution

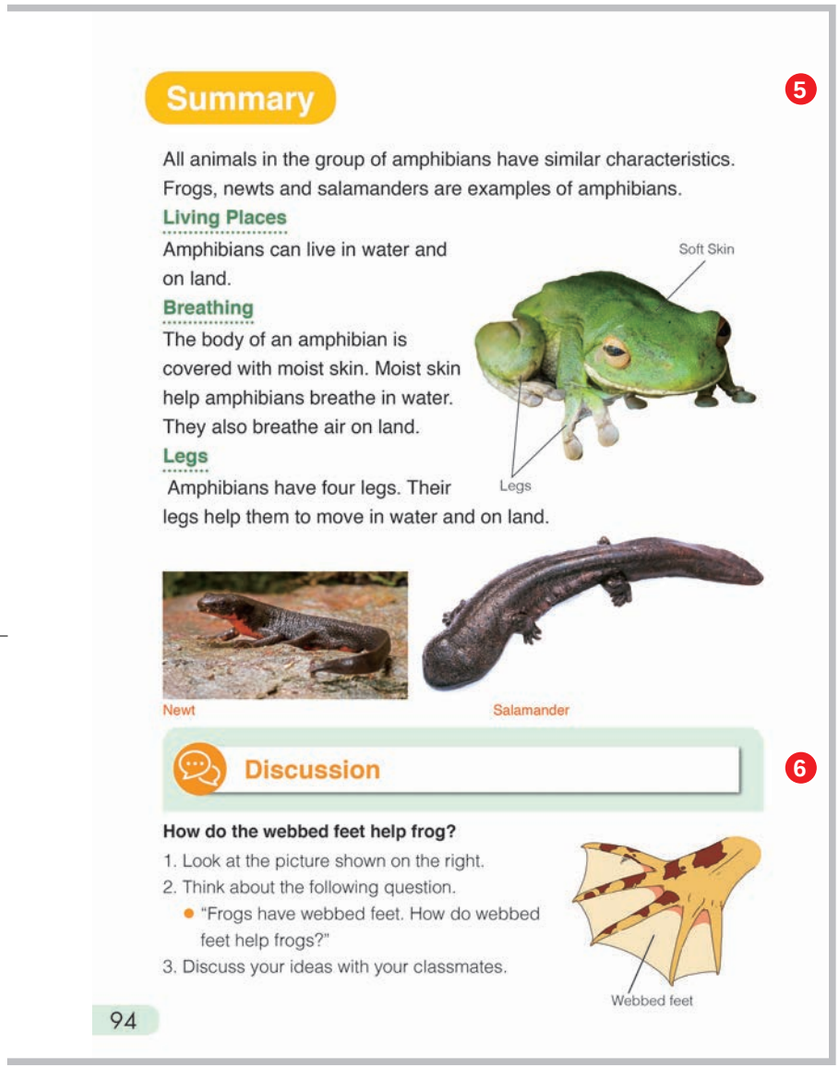
- Organise a member of the class group who is able to catch a frog to catch one before this lesson and put in a clear jar.
- After the frog is caught, it must be kept in a clear jar with a lid with punched in holes for the frog to breathe.

Lesson Objectives

Students will be able to:
- Identify the common characteristics of amphibians.

Assessment

Students are able to:
- Describe the common characteristics of amphibians based on their living places, breathing and their body parts.
- Show curiosity to learn about frogs



Summary

All animals in the group of amphibians have similar characteristics. Frogs, newts and salamanders are examples of amphibians.

Living Places

Amphibians can live in water and on land.

Breathing

The body of an amphibian is covered with moist skin. Moist skin help amphibians breathe in water. They also breathe air on land.

Legs

Amphibians have four legs. Their legs help them to move in water and on land.

Soft Skin

Legs

Newt

Salamander

Discussion

How do the webbed feet help frog?

1. Look at the picture shown on the right.
2. Think about the following question.
   - "Frogs have webbed feet. How do webbed feet help frogs?"
3. Discuss your ideas with your classmates.

Webbed feet

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- Write down students' findings on the blackboard.
- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:Where do frogs live? (Both on land and in water)

Q:What are frogs covered with? (They are covered with skins)

Q:How do frogs breathe? (They breathe through their lungs, etc)

Q:How do they move? (They move with their legs.)

- Conclude with discussion

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the black board.
- Ask the following questions:
  Q:What are the common characteristics of amphibians?
  Q:Give some examples of amphibians.
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion(5 min.)

- Let students think about the questions in 'Discussion' in their groups.
  Ask each group to present their answers and confirm them with students.
  Conclude the further discussion.

Sample Blackboard Plan

Title:

"Observing Amphibians

Key question

What characteristics do amphibians have in common?

Activity Characteristics of a frog

Questions on the characteristics of frogs	Characteristics
Where it lives	Land and water
What is it covered with?	Moist skin
What part does it use to move with?	Four legs
Any other characteristics?	Lays eggs, etc

Discussion

Q: Where do frogs live?

Both on land and in water

Q: What are frogs covered with?

They are covered with skin.

Q: How do frogs breathe?

They breathe with lungs, etc

Q: How do they move?

They wail, jump and swim with their legs.

Summary

- Amphibians have similar characteristics:
  - Living Places:
    Amphibians can live in water and on land.
  - Breathing:
    Amphibian is covered with moist skins.
    Moist skins help amphibians breathe in water.
    They also breathe air on land.
  - Legs:
    Amphibians have four legs. Their legs help them to move in water and on land.
- Frogs, newts, and salamanders are examples of amphibians.

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 40 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 95 - 96

Lesson 5 / 10

Lesson Title

Observing Reptiles

Preparation

- NIL

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson:

Q:What are the common characteristics of amphibians?

- Motivate students to think about the characteristics of reptiles by asking:

Q:Amphibians have some similar characteristics. How are reptiles alike?

2 Introduce the key question

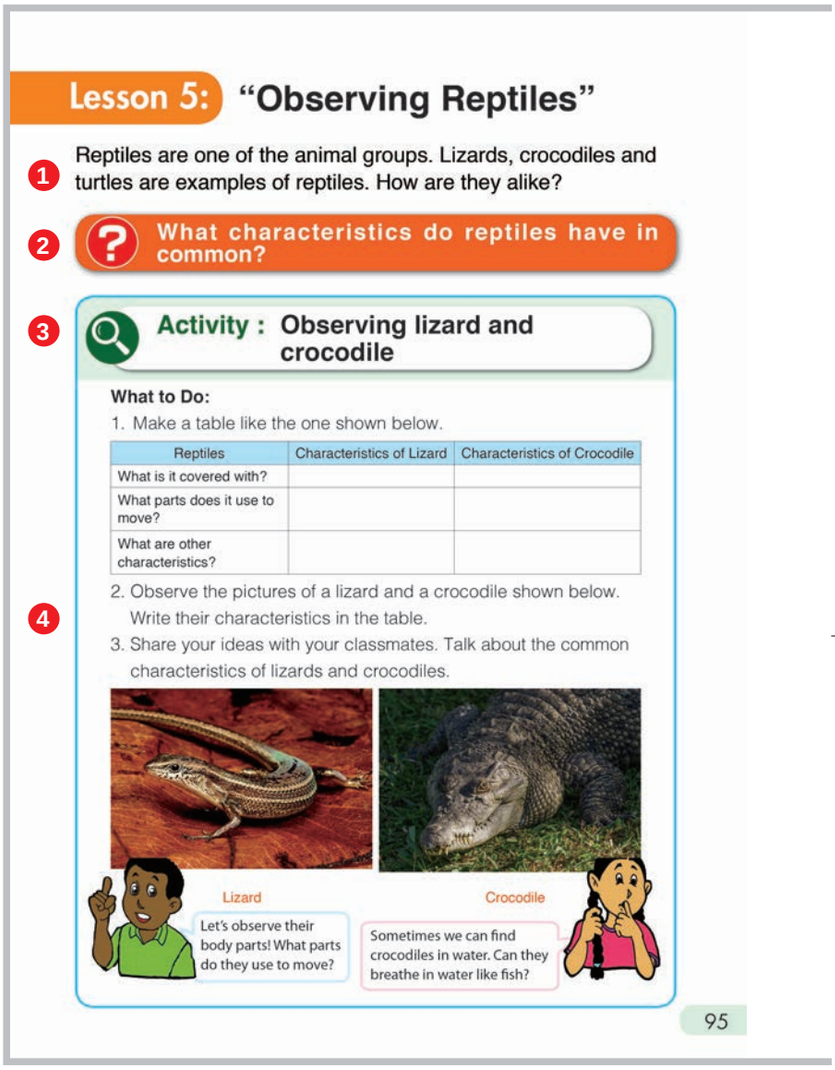
What characteristics do reptiles have in common?

3 Activity (15 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Ask students to draw the table in their exercise book.
- Have students do the activity and ask them to record their findings in the table.
- Refer students to the pictures of a lizard and crocodile and the characters' talking in the activity for their investigation.
- Ask students to discuss the characteristics of the lizard and crocodile based on their findings.

4 Discussion for findings (25min.)

- Ask students to present their findings from their activity. (Continue)



Lesson 5: "Observing Reptiles"

1 Reptiles are one of the animal groups. Lizards, crocodiles and turtles are examples of reptiles. How are they alike?

2 What characteristics do reptiles have in common?

3 Activity : Observing lizard and crocodile

What to Do:

1. Make a table like the one shown below.

Reptiles	Characteristics of Lizard	Characteristics of Crocodile
What is it covered with?		
What parts does it use to move?		
What are other characteristics?		

4 2. Observe the pictures of a lizard and a crocodile shown below. Write their characteristics in the table.

3. Share your ideas with your classmates. Talk about the common characteristics of lizards and crocodiles.

Lizard: Let's observe their body parts! What parts do they use to move?

Crocodile: Sometimes we can find crocodiles in water. Can they breathe in water like fish?

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Teacher's Notes

Additional information on reptiles

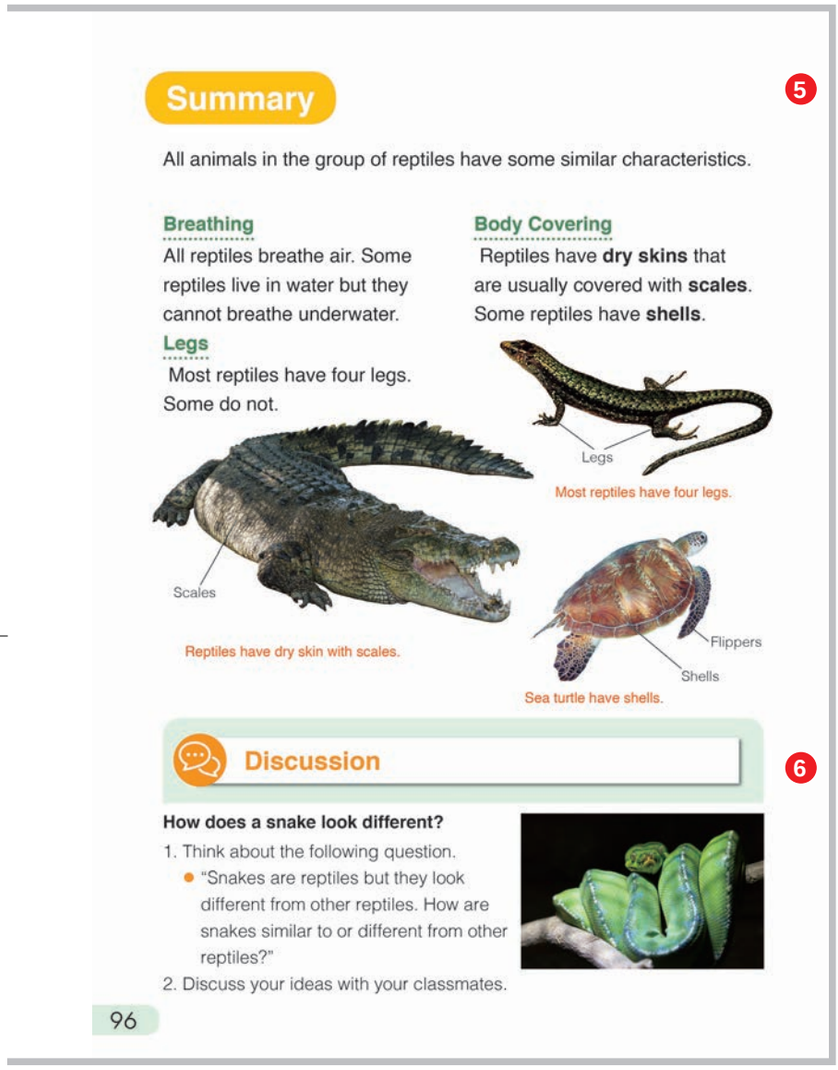
- Reptiles are vertebrate animals. Turtles, crocodilians, snakes, lizards, amphisbaenians and tuatara are the member of this group. Turtles have bony shell and live in water. Snakes don't have legs. They seem to be a different animal group, however, they have similarities; 1) mostly lay eggs, 2) covered with scales (small hard plates), 3) cold-blooded (taking body heat from surroundings) and 4) breathe through lungs
- Turtles are characterised by a special bony shell developed from their ribs which serves as a shield.
- Crocodilians are the largest reptiles which firstly appeared 95 million years ago (in the age of the dinosaurs).
- Lizards typically have four legs, feet and external ears. The adult length varies from a few centimetres to nearly 3 meters. The 'Papuan monitor', known as one of the longest lizards in the world, lives in the southern part New Guinea island (The world's largest lizard commonly recognized is 'Komodo dragon' which is much heavier and massive than the Papuan monitor but it is longer than Komodo dragon.
- Snakes are thought to have evolved from lizards. It had been specialised to live underground and lost its legs as a result.
- Amphisbaenians are also known as worm lizards characterised by long bodies, legless shape and rudimentary eyes.
- Tuatara lizard like reptiles are found only in New Zealand. They are considered to be the last survivors of reptiles that thrived in the age of the dinosaurs.

Lesson Objectives

Students are able to:
- Identify the common characteristics of reptiles.
- Compare the characteristics of reptiles.

Assessment

Students are able to:
- Describe the common characteristics of reptiles.
- List the similar characteristics of the lizard and the crocodile in a table.
- Co-operate actively with classmates during the investigation.



Summary 5

All animals in the group of reptiles have some similar characteristics.

Breathing
All reptiles breathe air. Some reptiles live in water but they cannot breathe underwater.

Body Covering
Reptiles have **dry skins** that are usually covered with **scales**. Some reptiles have **shells**.

Legs
Most reptiles have four legs. Some do not.

Discussion 6

How does a snake look different?

1. Think about the following question.
   - "Snakes are reptiles but they look different from other reptiles. How are snakes similar to or different from other reptiles?"
2. Discuss your ideas with your classmates.

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- Write down students' findings on the blackboard.
- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:How is a lizard and a crocodile alike? (They have legs, dry skin, live on land and lay eggs, etc.

Q:What are other animals that have similar characteristics like lizards and crocodiles? (Turtle, gecko, snake, etc)

- Conclude the discussion

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the board.
- Ask the following questions:
  Q:What are the common characersitics of reptiles?
  Q:Give some examples of reptiles.
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion (5 min.)

- Let students think about the question in 'Discussion' in their groups.
- Ask each group to present their answers and confirm them with students.

Sample Blackboard Plan

Title:
"Observing Reptiles"

Key question
What characteristic do reptiles have in common?

Activity Observing Lizard and Crocodile

Common characteristics	Characteristics of lizards	Characteristics of crocodiles
What is it covered with?	Scaled-like skin	Scaled-like skin
What parts do they use to move?	Use legs	Use legs
Any other?	Live on land, lay eggs, etc	Live on land, lay eggs, etc

Discussion
Q: How is a lizard and a crocodile alike?
They have legs, have dry skin, live on land, lat eggs, etc
Q: What are any other animals that have similar characteristics like lizards and crocodiles?
Turtle, gecko, snake etc

Summary
- Reptiles have some similar characteristics:
  - Breathing:
    All reptiles breathe air.
  - Legs:
    Most reptiles have four legs. Some don't have legs.
  - Body Covering:
    Reptiles have dry skins that are usually covered with scales. Some reptiles have shells
- Turtle, gecko, snake, crocodile, and lizard are examples of reptiles.

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 41 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 97 - 98

Lesson 6 / 10

Lesson Title

Observing Birds

Preparation

- Nil

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson

Q:What are the common characteristics of reptiles?

- Arouse students to think about the characteristics of reptiles by asking

Q:Reptiles have some similar characteristics. How about birds?

2 Introduce the key question

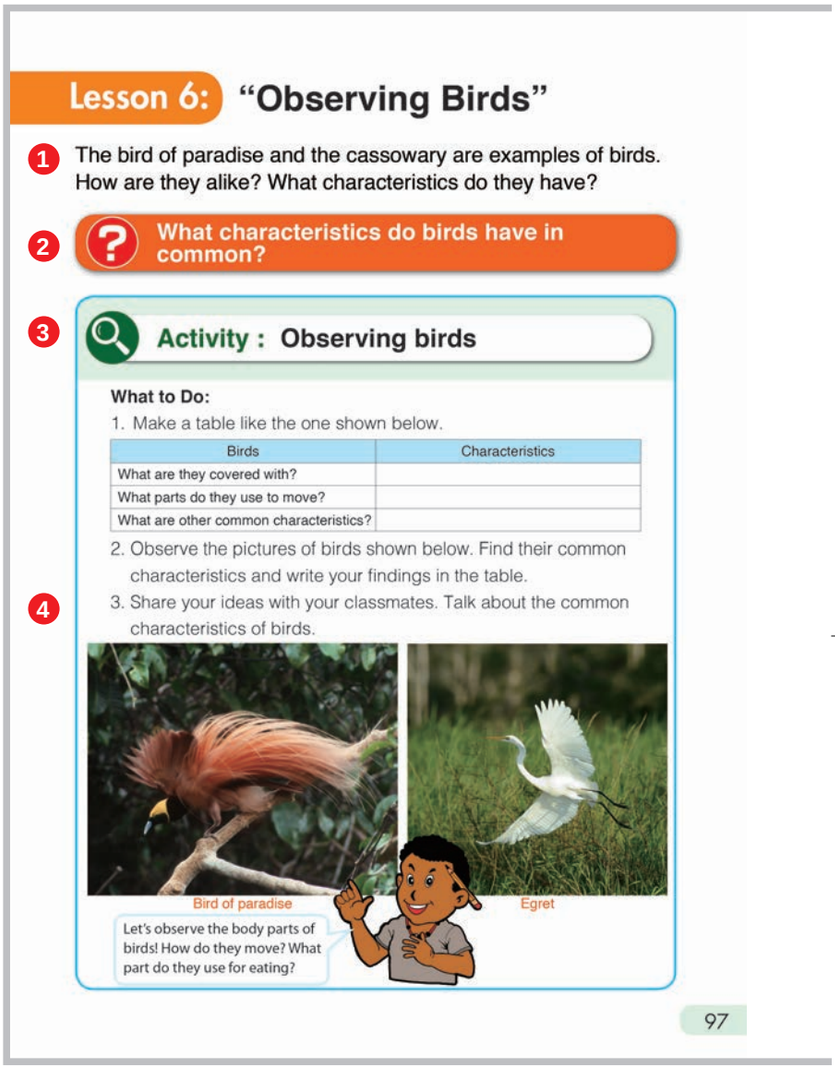
What characteristics do birds have in common?

3 Activity (25 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Ask students to draw the table in their exercise book.
- Have students do the activity and ask them to record their findings in the table.
- Refer the students to the pictures of the bird of paradise and the egret and the characters talking in the activity for their investigation.
- Ask students to discuss the characteristics of birds based on their findings.

4 Discussion for findings (25 min.)

- Ask students to present their findings from their activity. (Continue)



Lesson 6: "Observing Birds"

1 The bird of paradise and the cassowary are examples of birds. How are they alike? What characteristics do they have?

2 What characteristics do birds have in common?

3 Activity : Observing birds

What to Do:

1. Make a table like the one shown below.

Birds	Characteristics
What are they covered with?	
What parts do they use to move?	
What are other common characteristics?	

2. Observe the pictures of birds shown below. Find their common characteristics and write your findings in the table.
3. Share your ideas with your classmates. Talk about the common characteristics of birds.

4

Bird of paradise

Egret

Let's observe the body parts of birds! How do they move? What part do they use for eating?

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Teacher's Notes

Additional information on birds

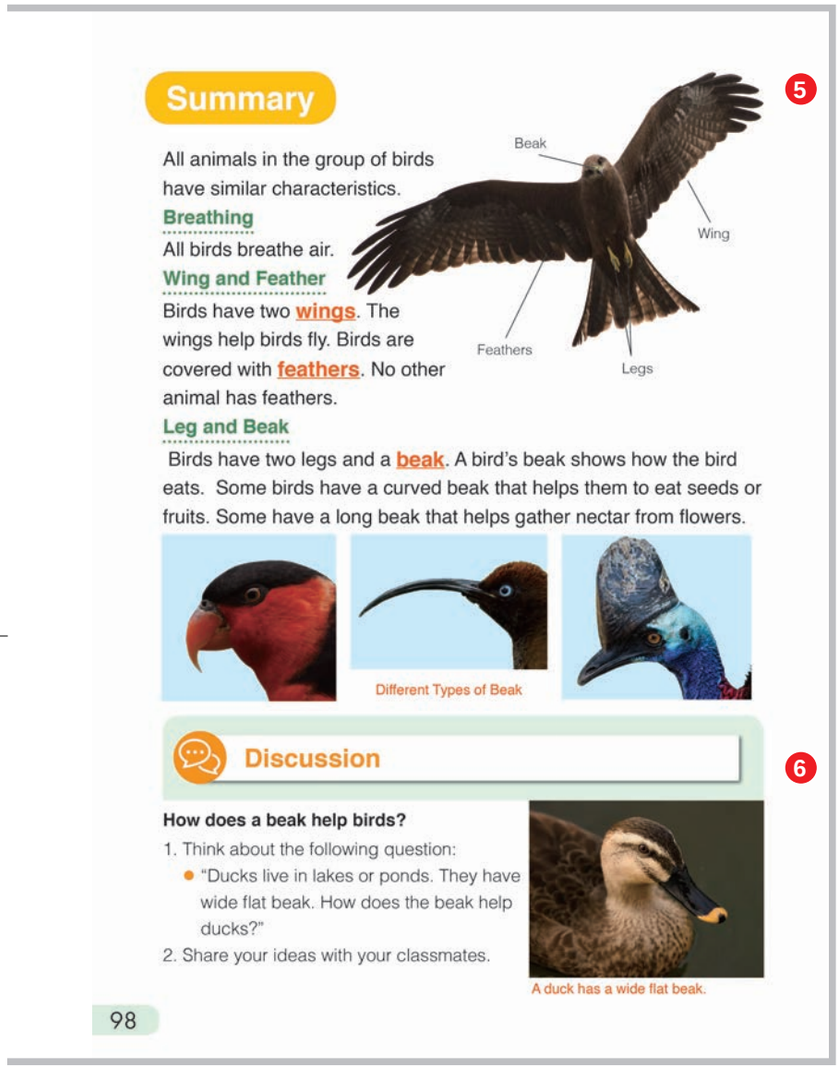
- Birds are vertebrate animals adapted for flight.
- Many can also run, jump, swim and dive. Some, like penguins, have lost the ability to fly but have retained their wings.
- Everything about the anatomy of a bird reflects its ability to fly. The wings, for example, are shaped to create lift. The leading edge is thicker than the back edge and they are covered in feathers that narrow to a point. Airplane wings are modelled after bird's wings.
- The tail feathers are used for steering.
- Even the way a bird reproduces is related to flight. Instead of carrying the extra weight of developing their young inside their bodies, they lay eggs and incubate them in a nest.
- They use their beaks to grab and swallow food. Birds use beaks for drinking, feeding their young and preening.
- Birds use beaks and feet as weapons to defend themselves, their nests and their chicks.

Lesson Objectives

Students are able to:
- Identify common characteristics of birds.
- Compare the characteristics of birds.

Assessment

Students are able to:
- Describe the common characteristics of birds based on breathing and body parts.
- List the similar characteristics of the bird of paradise and the egret in a table.
- Co-operate actively with classmates during investigation.



- Write down students' findings on the blackboard.
- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:How is a bird of paradise and an egret alike? (They have wings to fly, covered with feathers and a beak, etc)

Q:How do birds breathe? (They breathe air with their lungs, etc.)

Q:Why are the beaks of birds different in shapes? (It depends on the different kinds of food they eat, etc)

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the board.
- Ask the following questions:
  Q:What are the common characteristics of birds?
  Q:Give some examples of birds?
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion (10 min.)

- Let students think about the question in 'Discussion' in their groups.
- Ask each group to present their answers and confirm them with students.
- The beak helps to ladle small animals, insects and plants out of the water.
- Conclude the further discussion.

Sample Blackboard Plan

Title:

Observing Birds

Key question

What characteristics do birds have in common?

Activity

Observing birds

	Characteristics
What are they covered with?	Feathers
What parts do they use to move?	Wings and legs
Any other common characteristics?	Beak, lungs

Discussion

Q: How is a bird of paradise and an egret alike?

They have wings to fly, covered with feathers and have a beak, etc

Q: How do birds breathe?

They breathe air with lungs, etc

Q: Why are the beaks of birds different in shapes?

They eat different kinds of food, etc

Summary

- Birds have similar characteristics:
  - Breathing:
    All birds breathe air.
  - Wing and Feather:
    Birds have two wings.
    Birds are covered with feathers.
  - Leg and Beak:
    Birds have two legs and a beak.
    A bird's beak tells about how a bird eats.
    Different birds have different shaped beaks.

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 42 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 99 - 100

Lesson 7 / 10

Lesson Title

Observing Mammals

Preparation

- Nil

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson:

Q:What are the common characteristics of birds?

- Encourage students to think about the characteristics of mammals by asking:

Q:Birds have similar characteristics. How about mammals?

2 Introduce the key question

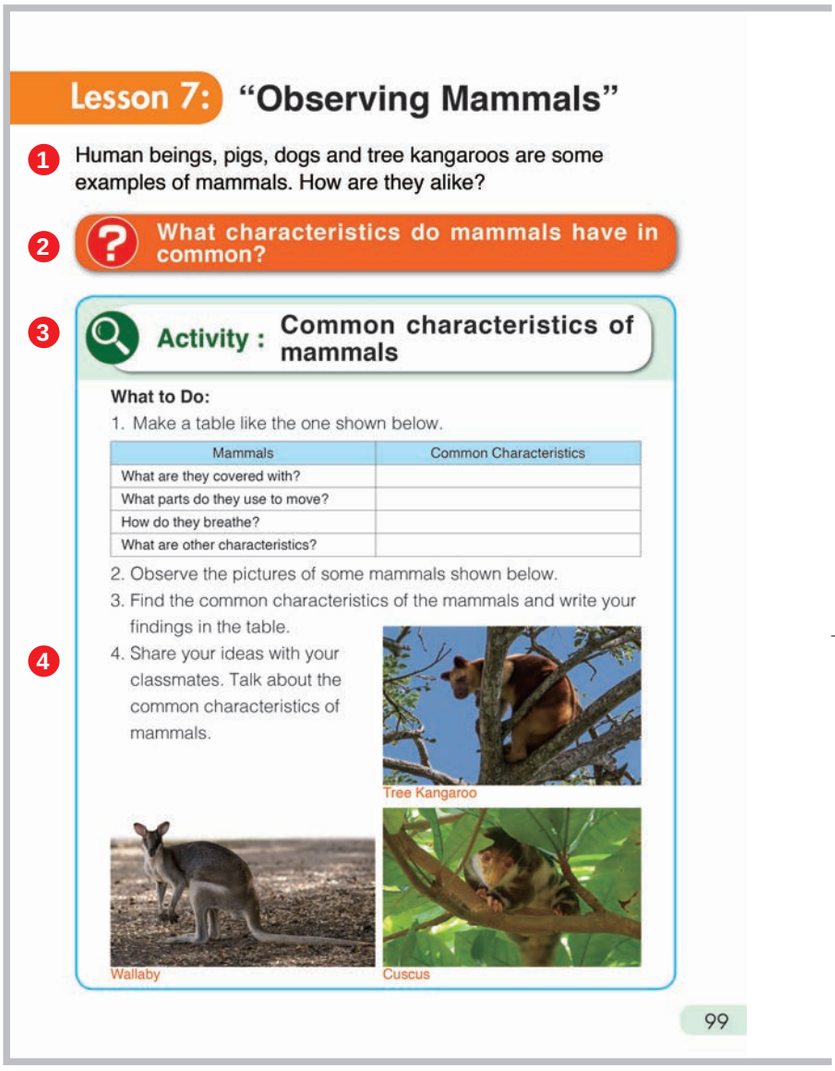
What characteristics do mammals have in common?

3 Activity (15 min.)

- Organise students into groups.
- Explain the steps of the activity.
- Ask students to draw the table in their exercise book.
- Have students do the activity and ask them to record their findings in the table.
- Refer students to the pictures of some mammals in the activity for their investigation.
- Ask students to discuss the characteristics of mammals based on their findings.

4 Discussion for findings (25 min.)

- Ask students to present their findings from their activity.
- Write down students' findings on the blackboard. (Continue)



Lesson 7: "Observing Mammals"

1 Human beings, pigs, dogs and tree kangaroos are some examples of mammals. How are they alike?

2 What characteristics do mammals have in common?

3 Activity : Common characteristics of mammals

What to Do:

1. Make a table like the one shown below.

Mammals	Common Characteristics
What are they covered with?	
What parts do they use to move?	
How do they breathe?	
What are other characteristics?	

2. Observe the pictures of some mammals shown below.
3. Find the common characteristics of the mammals and write your findings in the table.
4. Share your ideas with your classmates. Talk about the common characteristics of mammals.

Tree Kangaroo

Wallaby

Cuscus

99

Teacher's Notes

Additional information on mammals

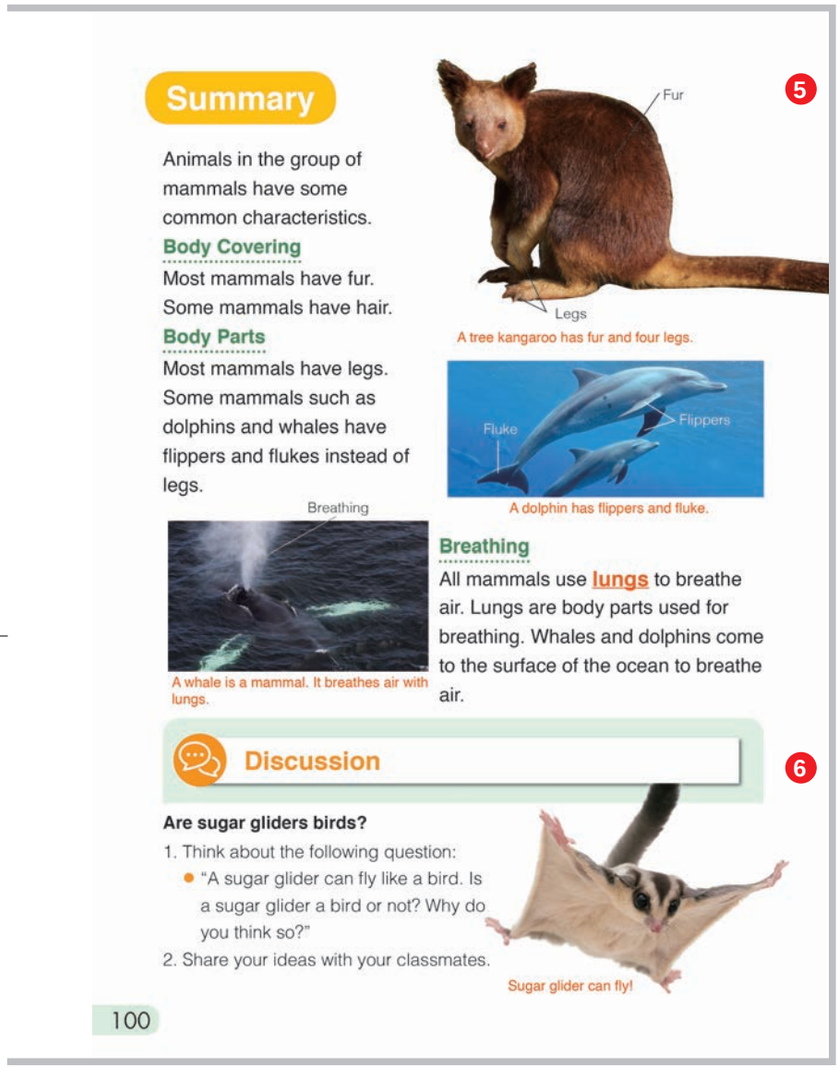
- Mammals are vertebrate animals. They give birth to live young. They have mammary glands which in females produce milk for feeding (nursing) their young. That is why they are called mammals.
- All mammals are viviparous except for the platypus that lives in Australia. It lays eggs but has mammary glands.
- The young of mammals are carried within the mother's womb and grow to relatively advanced stage of development before birth. In the marsupials (e.g. kangaroos, cuscus and wallabies), the newborns are incompletely developed at birth and continue to develop in pouchlike shelters attached to the area around female's mammary glands.
- Bats have mammary glands and give birth to live young. Thus, they are mammals. They are the only mammals that are naturally capable of flying.
- Hair is a typical mammalian feature, although it has disappeared in many dolphins and whales.
- Mammals breathe air using their lungs.

Lesson Objectives

Students will be able to:
- Identify the common characteristics of mammals.
- Infer the common body parts of mammals by comparing some mammals

Assessment

Students are able to:
- Describe the common characteristics of mammals based on breathing and body parts.
- List the similar characteristics of the different kinds of mammals in a table.
- Respect other students' responses



Summary

Animals in the group of mammals have some common characteristics.

Body Covering

Most mammals have fur. Some mammals have hair.

Body Parts

Most mammals have legs. Some mammals such as dolphins and whales have flippers and flukes instead of legs.

Fur
Legs
A tree kangaroo has fur and four legs.

Fluke
Flippers
A dolphin has flippers and fluke.

Breathing
A whale is a mammal. It breathes air with lungs.

Breathing

All mammals use lungs to breathe air. Lungs are body parts used for breathing. Whales and dolphins come to the surface of the ocean to breathe air.

5

Discussion

6

Are sugar gliders birds?

1. Think about the following question:
   - "A sugar glider can fly like a bird. Is a sugar glider a bird or not? Why do you think so?"
2. Share your ideas with your classmates.

Sugar glider can fly!

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- Confirm the findings with students.
- **Based on their findings,** ask the following questions.

Q:How are mammals alike? (They are covered with fur or hair, have 4 legs and they live on land, etc)

Q:A whale and a dolphin are similar to fish, but they are mammals. Why are they mammals and not fish? (They don't have gills. They breathe air with their lungs.).

- Conclude the discussion.

5 Summary (10 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the board.
- Ask the following questions:
  Q:What are the common characteristics of mammals?
  Q:Give some examples of mammals?
- Ask students to copy the notes on the blackboard into their exercise books.

6 Further Discussion (5 min.)

- Let students think about the question in 'Discussion' in their groups.
- Ask each group to present their answers and confirm their answers with students..

Sample Blackboard Plan

Title:

"Observing Mammals"

Key question

What characteristics do mammals have in common?

Activity Common characteristics of mammals

	Common Characteristics
What are they covered with?	Fur or hair
What parts do they use to move?	Legs
How do they breathe?	With their lungs
Any other characteristics?	Give birth to live young, etc

Discussion

Q: How are mammals alike?
They are covered with fur or hair, have 4 legs, they live on land, etc

Q: A whale and a dolphin are similar to fish, but they are mammals. Why are they mammals and not fish?
They don't have gills. They breathe air with lungs.

Summary

- Mammals have similar characteristics:
  - Body Covering:
    Most mammals have fur.
    Some animals have hair.
  - Body Parts:
    Most mammals have legs.
    Some mammals such as dolphins and whales have flippers and flukes
  - Breathing:
    All mammals use lungs to breathe air.
    Whales and dolphins come out the ocean to breathe air.

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 43 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 101 - 102

Lesson 8 / 10

Lesson Title

Animal Body Parts and Their Uses

Preparation

- Nil

Lesson Flow

1 Introduction (5 min.)

- Review the last lesson:

Q:What are the common characteristics of mammals?

- Motivate students to think about the different uses of animal body parts by asking:

Q:All animals in each group have common body parts. How do animals use their common body parts?

2 Introduce the key question

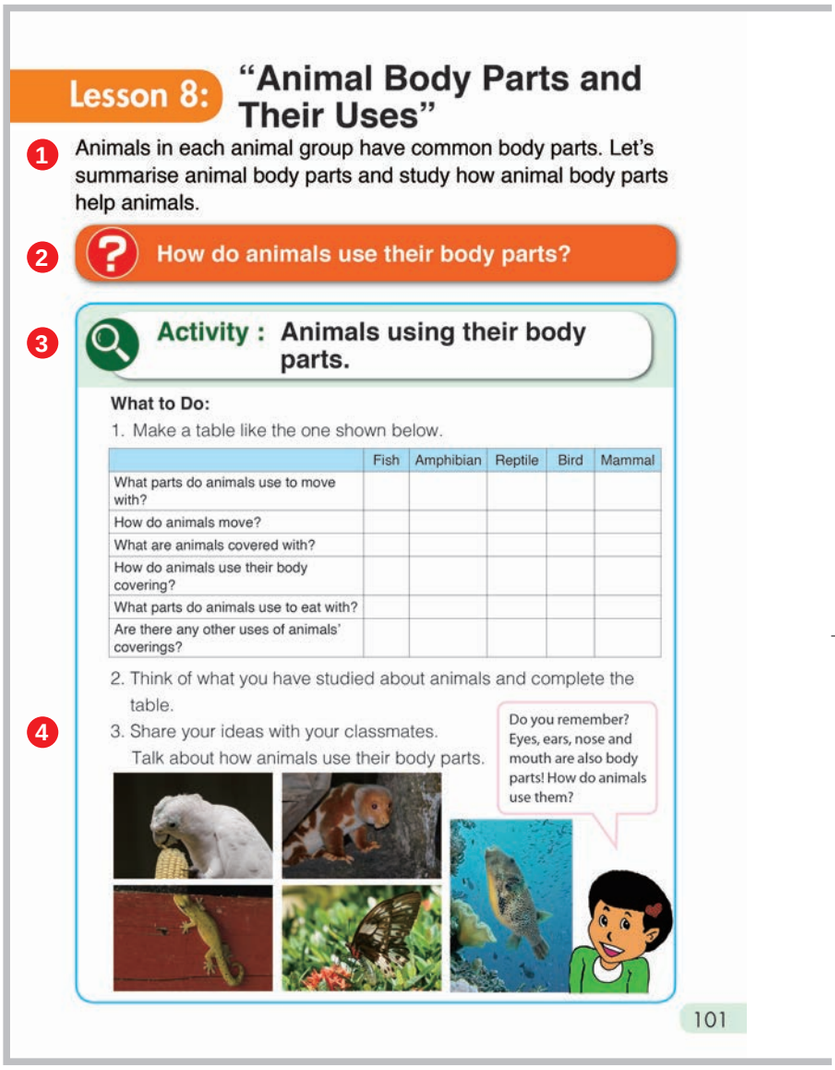
How do animals use their body parts?

3 Activity (30 min.)

- Organise students to work in groups.
- Explain the steps of the activity.
- Ask students to draw the table into their exercise books.
- Refer students to the pictures and the character's talking in the text book.
- Have students do the activity, and ask them to record their findings in the table.
- After that, ask students to discuss how animals use their body parts based on their findings.

4 Discussion for findings (20 min.)

- Draw a table on the black board.
- Ask students to present their findings from the activity.
- Write down students findings in the table on the black board. (Continue).



Lesson 8: "Animal Body Parts and Their Uses"

1 Animals in each animal group have common body parts. Let's summarise animal body parts and study how animal body parts help animals.

2 How do animals use their body parts?

3 Activity : Animals using their body parts.

What to Do:

1. Make a table like the one shown below.

	Fish	Amphibian	Reptile	Bird	Mammal
What parts do animals use to move with?					
How do animals move?					
What are animals covered with?					
How do animals use their body covering?					
What parts do animals use to eat with?					
Are there any other uses of animals' coverings?					

2. Think of what you have studied about animals and complete the table.

4 3. Share your ideas with your classmates. Talk about how animals use their body parts.

Do you remember? Eyes, ears, nose and mouth are also body parts! How do animals use them?

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Teacher's Notes

	Fish	Amphibian	Reptile	Bird	Mammal
What parts do animals use to move?	fins	legs	legs	wings, legs	legs, flippers
How do animals move?	swim	walk, swim	walk	fly, walk	walk, swim
What are animals covered with?	scale	moist skin	scale, shell	feather	fur, hair
How do animals use their body covering?	protection	Breathing in water	protection	keep warm	keep warm
What parts do animals use to eat?	mouth	mouth	mouth	beak	mouth
Any other parts and how do animals use them?	gills to breathe	---	---	---	---

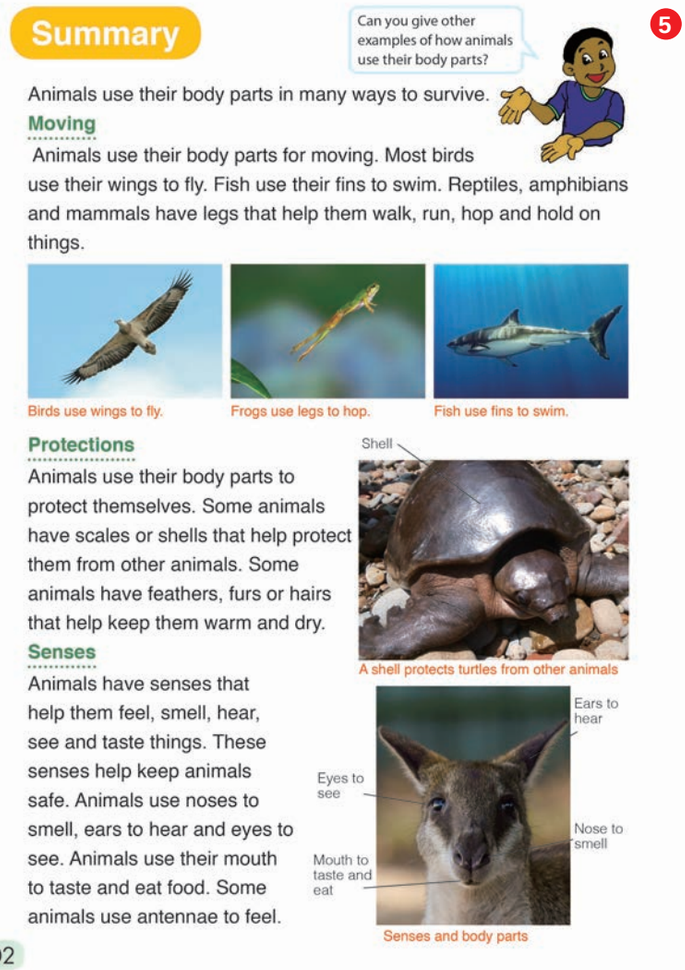
- Some animal groups may have a variety of animals with different types of body parts used for a similar purpose.
- Likewise, some animal body coverings may be used for more than one purpose.

Lesson Objectives

Students will be able to:
- Identify how animals use their body parts.
- Explain the importance of animal body parts.

Assessment

Students are able to:
- Explain the different ways that animals use their body parts according to their movements, protections and senses.
- Describe the reason why animal body parts are important.
- Listen to the other students' opinions with respect.



Summary

Can you give other examples of how animals use their body parts?

Animals use their body parts in many ways to survive.

Moving

Animals use their body parts for moving. Most birds use their wings to fly. Fish use their fins to swim. Reptiles, amphibians and mammals have legs that help them walk, run, hop and hold on things.

Birds use wings to fly. Frogs use legs to hop. Fish use fins to swim.

Protections

Animals use their body parts to protect themselves. Some animals have scales or shells that help protect them from other animals. Some animals have feathers, furs or hairs that help keep them warm and dry.

Shell

A shell protects turtles from other animals

Senses

Animals have senses that help them feel, smell, hear, see and taste things. These senses help keep animals safe. Animals use noses to smell, ears to hear and eyes to see. Animals use their mouth to taste and eat food. Some animals use antennae to feel.

Ears to hear
Eyes to see
Nose to smell
Mouth to taste and eat

Senses and body parts

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- Facilitate active students' discussion.
- Confirm the findings with students.
- **Base on their findings** ask the following questions as discussion points:

Q:How do animals use their body parts to move? (They use their legs to walk or run, their wings to fly, their fins to swim in water, etc)

Q:How do animals use their body parts for protection? (They use their scales or shells to protect themselves from other animals, they use their feathers, furs, or hairs to help keep them warm, etc)

Q:How do animals use their eyes, ears, nose, and mouth? (Eyes to see, ears to hear, nose to smell and mouth to taste.)

Q:Why are animal's body parts important? (To survive)

- Conclude the discussion.

5 Summary (5 min.)

- Ask the students to open their textbooks to the summary page and explain it.
- Summarise today's lesson on the blackboard.
- Ask the following questions:
  Q:How do animals use their body parts?
  Q:Why are animals' body parts important?
  Q:How are senses helpful to animals?
- Ask students to copy the notes on the blackboard into their exercise books.

Sample Blackboard Plan

Title: "Animal Body Parts and their Uses"

Key question
How do animals use their body parts?

Activity
Animals using their body partsts.

	Fish	Amphibian	Reptile	Bird	Mammal
What parts do animals use to move?					
How do animals move?					
What are animals covered with?		Refer to Teacher's Note			
How do animals use their body covering?					
What parts do animals use to eat?					
Any other parts and how do animals use them?					

Discussion
Q: How do animals use their body parts to move?
They use legs to walk or run, they use wings to fly, etc
Q: How do animals use their body parts for protection? They use scales to protect themselves from other animals, they use feathers, furs, or hairs that help keep themselves warm. etc.
Q: How do animals use their eyes, ears, nose, and mouth? Eyes to see, ears to hear, nose to smell, mouth to taste.
Q: Why are animal's body parts important? To survive

Summary
Animals use their body parts to survive in many ways:
1. For moving
2. For protecting themselves and keeping them warm
3. Use their senses to keep them safe

Unit	Chapter : **4. Characteristics of Animals**	Total lesson No: 44 / 94
Animals	Topic : **4.1. Observing Animals**	Textbook page: 103 - 105

Lesson
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Lesson Title

Summary and Exercise

Tips of lesson

1 Summary (20 min.)

- Recap main learning contents in this topic
- Ask some questions to students and verify student understanding. Explain and correct learning contents again if they still have misconceptions.
- Ask students the names of six main animal groups
- Provoke students to tell some animal names in each animal group with its common characteristics.
- Ask students what body parts animals use for moving, protection and their senses.

1

Summary and Exercise

Summary 4.1 Observing Animals

Animals around us

We can find many different kinds of animals around us. Animals can be grouped into insects, fish, amphibians, reptiles, birds and mammals.

Observing animals

Animals in different groups have common characteristics.

	Insects	Fish	Amphibians
			
Breathing	(study later)	Gills	Moist skins and lungs
Legs	Six legs	No legs (fins)	Four legs
Body covering	Hard outer covering	Scales	Moist skins
Other common body part	A pair of antenna		

	Reptiles	Birds	Mammals
			
Breathing	Lungs	Lungs	Lungs
Legs	Four legs (turtles have flippers and snakes have no legs.)	Two legs and two wings	Four legs (dolphins have flippers and fluke.)
Body covering	Scales (some have shells)	Feathers	Fur and hair
Other common body part		A beak	

How animals use body part

Animals use their body parts for moving, protection and for sensing.

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2 Exercise & Explanation (30 min.)

- Allow students to try answering questions individually with enough time in response to students understanding.
- After the test, give them answers of the questions and explain how to solve the questions by asking student's answers and thought.
- Guide students well to understand the main ideas or concepts in response to their answers.
- If concept is still difficult for the students to understand, then do experiments again or demonstrate if necessary.

2

Summary and Exercise

Exercise 4.1 Observing Animals

Q1. Complete each sentence with the correct word.

(1) Animals can be grouped into insects, fish, amphibians, reptiles, birds and _____.

(2) An _____ has three pairs of legs.

(3) The body of an _____ is covered with moist skin.

(4) Fish use _____ to swim.

(5) Turtles have shells for _____ from other animals.

Q2. Choose the letter with the correct answer.

Which of following characteristics is wrong about mammals?

A. Most mammals have fur or hair.

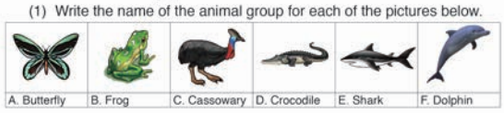
B. Most mammals have four legs.

C. All mammals use lungs to breathe.

D. Most mammals have dry scales.

Q3. Answer the following questions.

(1) Write the name of the animal group for each of the pictures below.



A. Butterfly B. Frog C. Cassowary D. Crocodile E. Shark F. Dolphin

(2) What body parts do animals use for the following.

A. Hearing sound	B. Seeing objects	C. Smelling
D. Tasting and eating	E. Flying	F. Walking

Q4. Fill the blanks in the sentence below.

Pegasus (see picture on the right) is an imaginary creature.

It is not a bird because it has four _____ to run.

It is not a mammal too because it has two _____ with feathers to fly.

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Exercise answers

Q1.
(1) **mammals**
(2) **insect**
(3) **amphibian**
(4) **fins**
(5) **protection**
Some animals have shells to protect themselves from other animals.

Q2.
D
Common characteristics for mammals are A, B and C. Most reptiles have dry scales.

Q3.
(1) A. **Insects**
B. **Amphibians**
C. **Birds**
Cassowary is one of the biggest birds in the world.
D. **Reptiles**
E. **Fish**
Shark use gills to breathe in the water.
F. **Mammals**
Dolphin is a mammal. Dolphin use lungs to breathe air and have fins instead of legs.

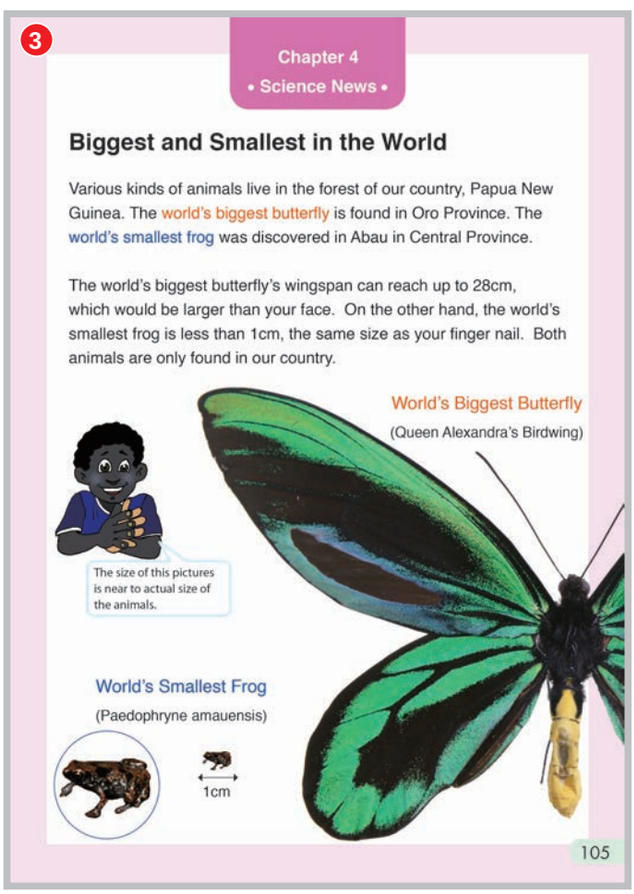
(2) A. **Ear**
B. **Eyes**
C. **Nose**
D. **Mouth**
E. **Wings**
F. **Legs**

Q4.
It is not a bird because it has four legs to run. It is not a mammal, too, because it has two **wings** with feathers to fly.

Explanation of Science Extras

3 Science Extras (10 min.)

- Give opportunities to students to closely observe the nature and its phenomena in the world.
- Introduce unique animals in Papua New Guinea which are the world's biggest butterfly and world's smallest frog. Both animal species are discovered only in Papua New Guinea.
- Give opportunities to students to closely observe the nature and its phenomena in the world.
- Allow students to ask questions that demonstrate curiosity about the content in the column.
- Provoke students to think about how our land has unique and precious natural environment for animals



Lesson
10 / 10

Lesson Title

Chapter Test

Answer of the Chapter Test

Chapter Test

4. Characteristics of Animals

Q1 Complete each sentence with the correct word.

(1) Animals can be grouped as insects, fish, reptiles, birds, mammals and Amphibians.
(2) An animal that has skin covered with dry scales is called Reptiles.
(3) An animal that has hair or fur and four legs is called Mammals.
(4) An animal that has wings, feathers and beak is called Birds.
(5) Toads belong to Amphibians because they have moist skin.

Q2 Choose the letter with the correct answer.

(1) Which of the following characteristic is wrong about fish?
A. Covered with scales on their body for protection.
(B.) Use their lungs to help them breathe in water.
C. Live in fresh and salt water.
D. Has fins instead of legs.

(2) Which of the following characteristic is correct about Amphibians?
(A.) Their soft moist skins help them breathe in water and on land.
B. Tortoise is amphibian because it lives in water and on land.
C. Amphibian has fins to swim in water.
D. Frog, salamander and snake are Amphibians.

(3) Which of the following characteristic is correct about birds?
A. Birds breathe air by gills.
B. Birds have a pair of antenna to fly.
(C.) Shape of bird's beak varies depending on how a bird eats.
D. Sugar glider is a kind of bird because it can fly in the sky.

(4) Which of the following groups of animals would come under insects?
A. turtle, crocodile, cuscus, frog
B. grasshopper, butterfly, mosquito, spider
(C.) sardine, snake, prawn, crab
D. ants, beetle, bees, dragonfly

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Q3

Study the animals shown in the box below and answer the questions.


A. Parrot


B. Anemone fish


C. Cat


D. Dolphin

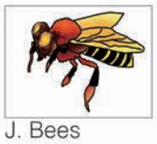

E. Shark


F. Crocodile


G. Frog


H. Cuscus


I. Bird of Paradise


J. Bees

(1) Name the animals that belong to "Fish" and "Amphibian" from the picture above and describe the differences between them.

Fish are "B. Anemone fish" and "E. Shark". Amphibian is "G. Frog". Fish has gills to breathe in water, but amphibian breathe on land and water. Fish body is covered by scale but amphibian skin is dot and moist. Amphibian uses legs to move, while fish uses fins.

(2) A dolphin has been under water for a long time. Predict what will happen.

Dolphin will come out water to breathe air by lungs.

(3) Classify the above animals into 3 groups according to their way of moving. Use the table below to classify them.

Way of moving and used body parts	Name of Animals
Using wings to fly	Parrot, Bird of paradise , Bees
Using fins/flippers to swim	Anemone fish, Dolphin, Shark,
Using legs to walk, run, hop etc	Cat, Crocodile, Frog, Cuscus

Q4

(1) Look at the picture of a crab on the right:
Is a crab an insect? Give your reason.

Crab is not insect, because the body parts are not separated as the head, the thorax and the abdomen. The number of legs are also more than three pairs.

(2) What would you need to think about to care for a pet frog?

Amphibian lives both in water and on land, thus we should provide both water and land area in their aquarium.