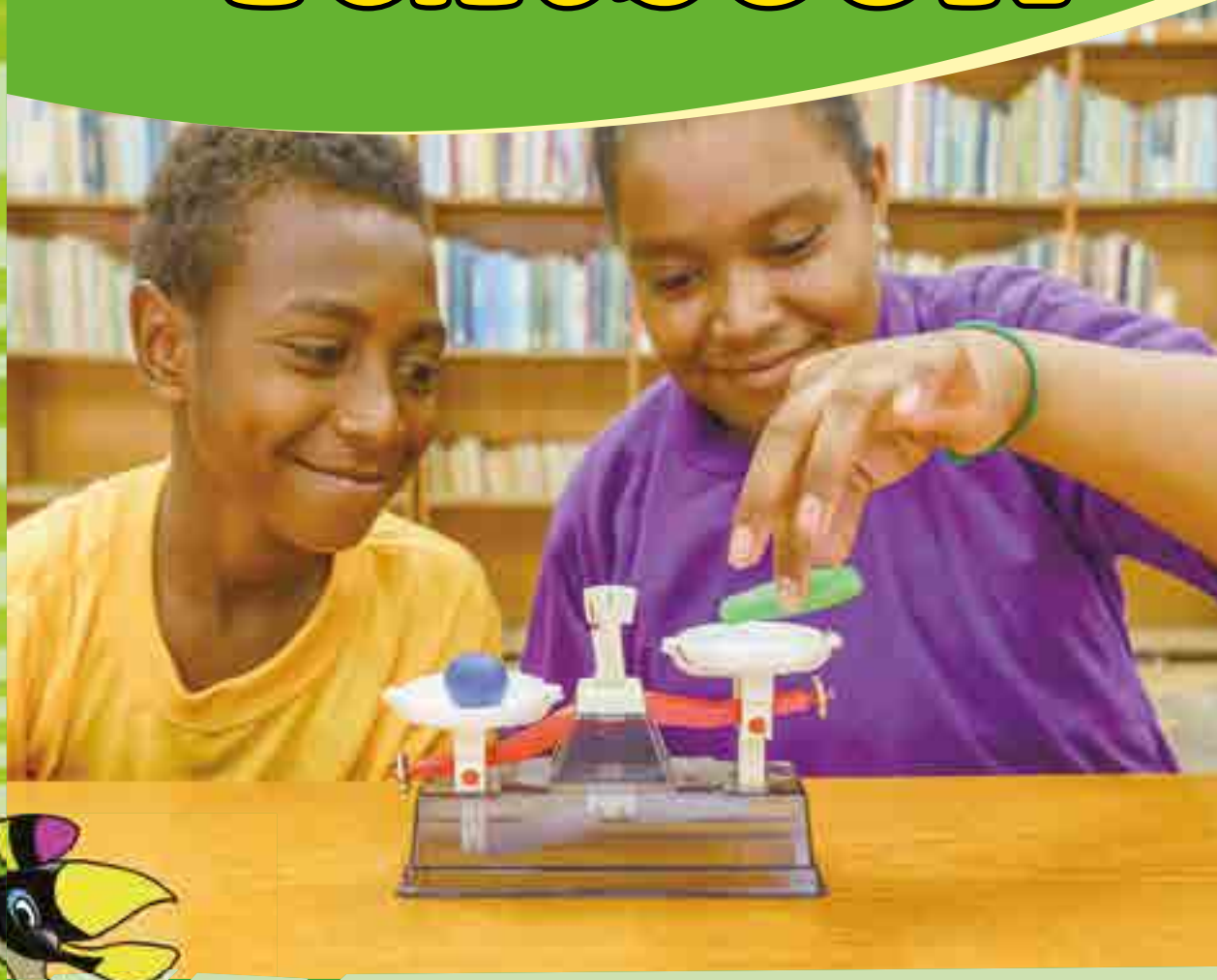
National SCIENCE Textbook



Grade 3

Papua New Guinea
Department of Education

From
the People of Japan

JICA

QUIS-ME

Issued free to schools by the Department of Education

First Edition

Published in 2019 by the Department of Education, Papua New Guinea.

ISBN 978-9980-905-13-0

Acknowledgements

The Grade 3 National Science Textbook was developed by the Curriculum Development Division in partnership with the Science specialists from Japan through the Project for Improving the Quality of Mathematics and Science Education also known as QUIS-ME Project.

The Science curriculum officers, textbook writers, pilot teachers from NCD and Central Provinces and the Subject Curriculum Group (SCG) are acknowledged for their contribution in writing, piloting and validating this textbook.

The Curriculum Panel members, members of the Subject Advisory Committee (SAC) and the Basic Education Board of Studies (BEBOS) are also acknowledged for their advice, recommendation and endorsement of this textbook.

A special acknowledgement is given to the People and the Government of Japan for the partnership and support in funding and expertise through Japan International Cooperation Agency (JICA) - QUIS-ME Project with Curriculum Development Division (CDD).

National Science Textbook

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Minister's Message

Dear Grade 3 Students,

I am honoured to give you my message in this National Science Textbook. The Government of Papua New Guinea through the Department of Education has been giving priority to improve students' learning in the area of Science for many years. I would like to thank the Government of Japan for its support in improving the quality of learning and education for our children in PNG.

This Science Textbook was developed by our very own Curriculum Officers, Textbook Writers and pilot teachers who have worked together with the Japanese specialists for three years to complete this Textbook. I believe this is the best national textbook for Grade 3 students in PNG because it is comparable with international standards.

I am excited about this Textbook because it contains a lot of exciting student centered topics and activities for science recommended for learning in Grade 3. You will find many photographs, illustrations, charts and diagrams that are based on PNG context and are interesting and exciting for learning. I hope this textbook will motivate you to explore more because Science is about learning what, why and how things work in everyday life.

Students, Science is a very important subject because it allows you to make your own predictions, carry out experiments to test your predictions and find solutions for your predictions. This will then challenge you to find ways of improving your learning using the Science as Inquiry approach. Science is about everything – everywhere and by using the inquiry approach you will enjoy learning many things that happen around you every day. You will learn about why things move, how plants grow, why we have days and nights and many more interesting things that happen. In addition, Science processes will help you become an independent learner and empower you to become a scientist in the future to solve problems relating to life in PNG and anywhere else in the world.

I encourage you to be committed and to enjoy and love Science, because one day in the future you will be a very resourceful person, participating in developing and looking after this very beautiful country of ours and improving the quality of living.

I wish you a happy and fun learning experience with this Grade 3 Science Textbook.

Hon. Nick Kuman, B.ApSci.UWSyd, MP
Minister of Education

Message from the Ambassador of Japan

Greetings to Grade 3 Students of Papua New Guinea!

It is a great pleasure that the Department of Education of Papua New Guinea and the Government of Japan worked together to publish national textbooks on science for the first time.

The officers of the Curriculum Development Division of the Department of Education made full efforts to publish this textbook with Japanese science experts. To be good at science, you need to keep studying with this textbook. In this textbook, you will learn many things about science with a lot of fun and interest, and you will find it useful in your daily life. This textbook is made not only for you but also for the future students.

You will be able to think much better and smarter if you gain more knowledge on numbers and diagrams through learning science. I hope that this textbook will enable you to enjoy learning science and enrich your life from now on. Papua New Guinea has a big national land with plenty of natural resources, and a great chance for a better life and progress. I hope that each of you will make full use of knowledge you obtained and play an important role in realizing such potential.

I am honoured that, through the publication of this textbook, Japan helped your country develop science education and improve your ability, which is essential for the future of Papua New Guinea. I sincerely hope that, through the teamwork between your country and Japan, our friendship will last forever.

Satoshi Nakajima

Ambassador of Japan to Papua New Guinea

SCIENCE...

It's exciting...

It's amazing...

It's fun...

It's Science

Secretary's Message

Dear students,

This is your Science Textbook that you will use in Grade 3. It contains a lot of very interesting and enjoyable activities that you will be learning in your daily Science lessons.

In our everyday lives, we come across many situations such as lifting heavy coffee bags onto a vehicle, travelling long distances to fetch water and trying our best to make our food plants grow during dry seasons. These situations are real and they contribute to the way we live. By learning Science through this textbook, it will help you address real-life problems.

This Textbook provides you with a variety of science activities and ideas that are interactive. It allows you to learn with your teacher or on your own as an independent learner. The activities are designed in a way that a problem is given and you as the learner will have to solve the problem using the different scientific skills such as making predictions, measuring, recording data and communicating results. These are important tools needed to understand the concepts given in each chapter or topic and are applied in solving science problems. In addition, science process skills will help you to make decisions that will benefit you, your family, your community, province and the country to improve the standard of living in PNG in the 21st Century and beyond.

I encourage you to enjoy learning Science and think like a young Scientist who is competent to solve problems and issues that are happening in the community, country and the world today.

I wish you all the best in studying Science using this Textbook.

Dr. Uke Kombra, PhD
Secretary for Education

Content

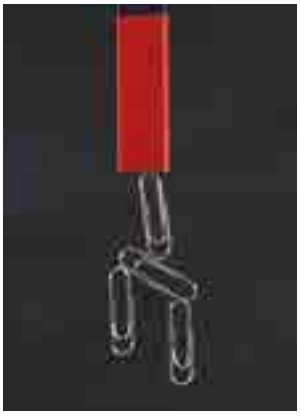
Strand

- Life
- Physical Science
- Earth and Space

How to learn SCIENCE

1 Wonder or Question

- Look carefully at things in nature around you and things in your daily life.
- Realise things that you wonder about.
- Identify the key question in the lesson.



2 Research

- Guess what will happen at the end of the activity.
- Understand the steps of the activity.
- Observe or conduct experiment in the activity.
- Record the result in your exercise book.
- Check if the result is the same with your guess.
- What do you find from the observation or experiment?

Symbols used in this textbook

Each symbol gives you an attention about:

- : Key question in the lesson.
- : Activity that you will try.
- : Discussion question with your friends.
- : Caution and warning.
- : Try it!

with this Textbook

Learn about nature, learn from nature

3 Findings

- Present and share your findings to your friends.
- Discuss with your friends to make sure if your findings are correct.
- Make conclusion to the key question.

4 Summary

- Read the textbook and confirm what you learnt in the lesson.
- Summarise what you did in the lesson.
- Let's try to use things you learnt in your daily life.

Friends learning together with you

Friends learning together in this textbook

Chapter 1

Observing Our Environment

1.1 Environment around Us

Lesson 1: "Our Environment"

Look around us! We are surrounded by different kinds of things.

What are we surrounded by?

Activity : Finding things around us

What to Do:

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

Name of things you found	Where did you find the things?

2. Find things inside or outside your classroom.
3. Write the name of the things you found and the place where you found the things in the table.
4. Share your ideas with your classmates. Talk about what you are surrounded by.

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?

Lesson 2: "Types of Environments"

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

What types of environments are there?

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.

Things made by people	Things not made by people

Chicken

Fried Chicken

Summary

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.

Natural Things

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

Lesson 3: "Things in the Environment"

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?

Can we group things in the environment in different ways?

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.

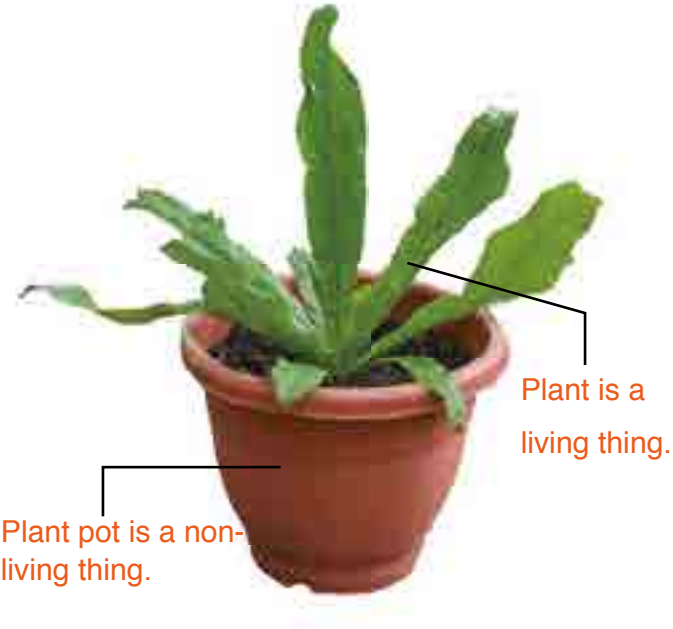
Summary

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



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

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

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

How do living things depend on non-living things?

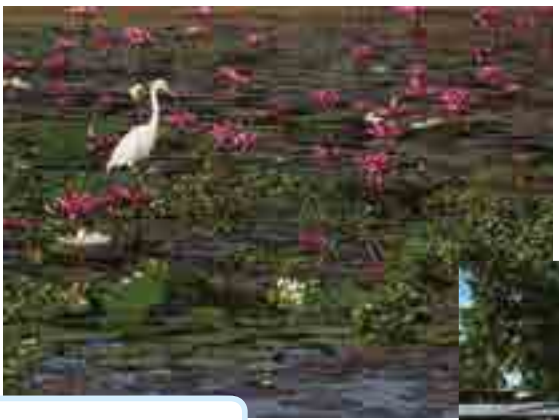
Activity : Non-living things necessary for living things

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.



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.

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.

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.

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?

1.2 Interaction between Living Things and the Environment

Lesson 1: "Living Things in the Environment"

Plants and animals are living things. Living things make up our environment. Where can we find them in the environment?

Where do living things live and grow in the environment?

Activity : Finding where living things live

What to Do:

1. Draw a table like the one shown below.

Name of animal	Where the animal lives

2. Think of different animals you have seen. Write the names of the animals and the places where they live in the table.
3. Share your ideas with other groups. Talk about where animals live in the environment.

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.

Lesson 2: "Basic Needs of Living Things"

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

What do living things need to live?

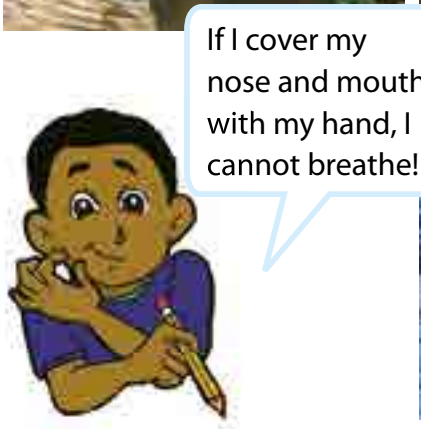
Activity : The needs of living things

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.



Summary

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.

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

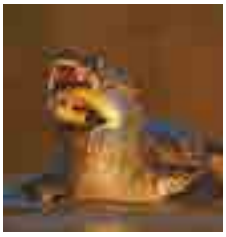
- A wetland is a place that is always wet including areas such as rivers, lakes and swamp.

☑ 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

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?

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.

Chapter Test

1. Observing Our Environment

Q1

Complete each sentence with the correct word.

(1) We all live in the _____, 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_____ thing.

(3) Animals need _____ 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.

Q3

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

_____

_____

(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:_____

_____

(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.

_____

_____

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?

_____

_____

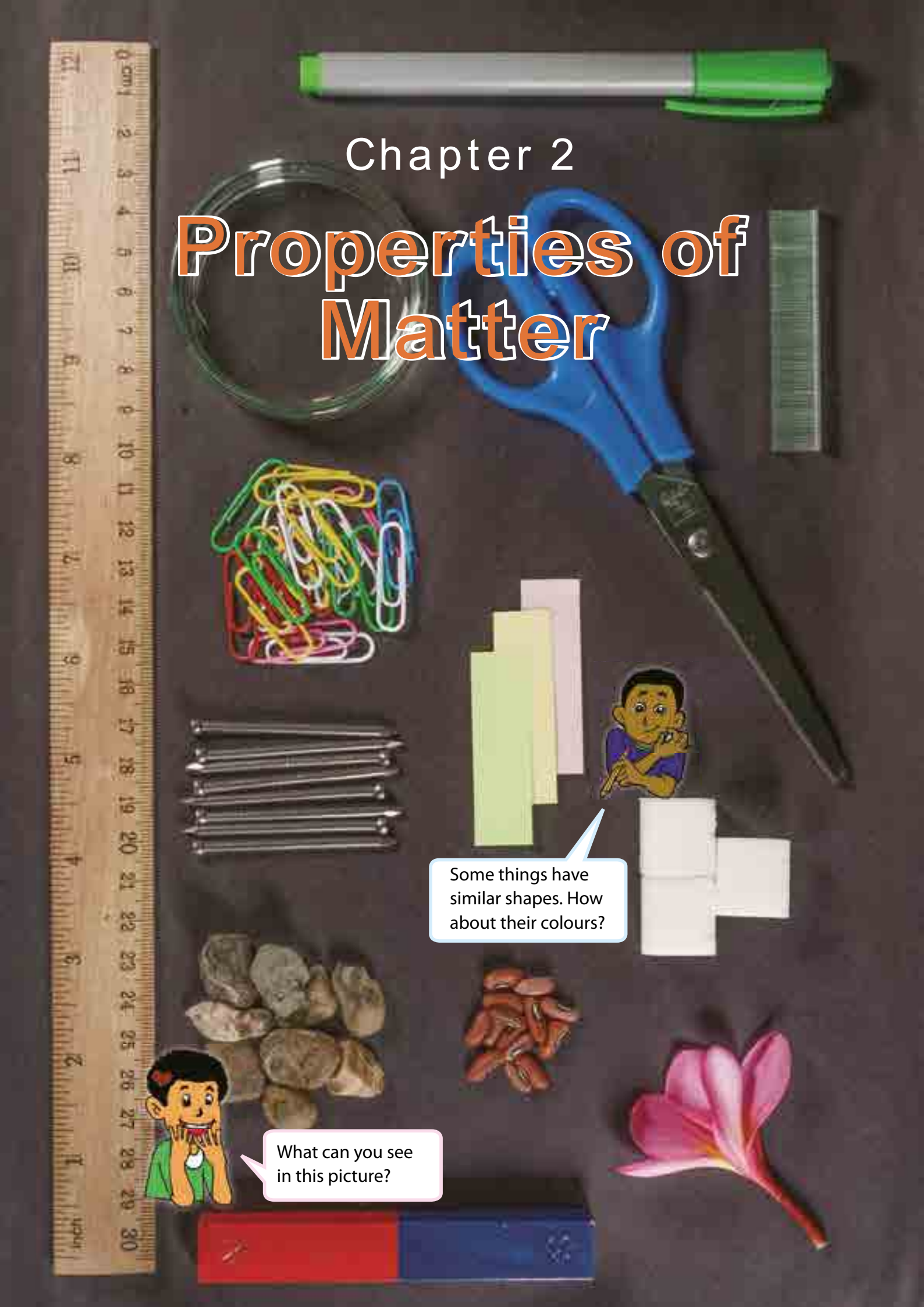
(2) A camel is an animal living in extreme environment called desert. Camels, store fats in their humps on the back and their pee is very little. Explain how their body structure suits their living environment in terms of basic needs of living things.

_____

_____

_____

_____


Chapter 2
Properties of Matter
Some things have similar shapes. How about their colours?
What can you see in this picture?

2.1 Describing Matter

Lesson 1: "Matter around Us"

What is matter? Matter is what all things are made of. Can you find matter around you?

What is matter?

Activity : Finding matter around us

What to Do:

1. Make a table like the one shown below.
2. Look at the picture below and find different matter in the room.
3. Write in the table the names of the different matter you found.
4. Share your ideas with your classmates. Talk about things that are matter and things that are not matter.

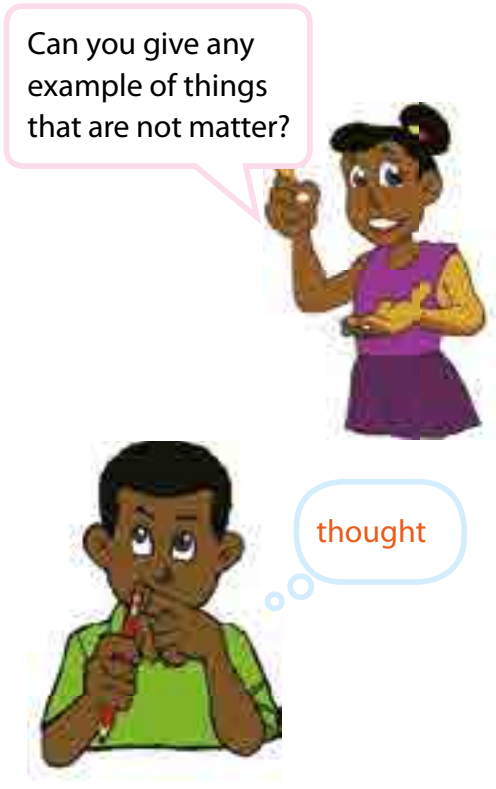
Name of Matter You Find

Summary

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.



Light

Sound

Lesson 2: "Properties of Matter"

Matter is everything around us. A desk, dog, flower, air and water are all matter. How are they similar or different?

How can we describe matter?

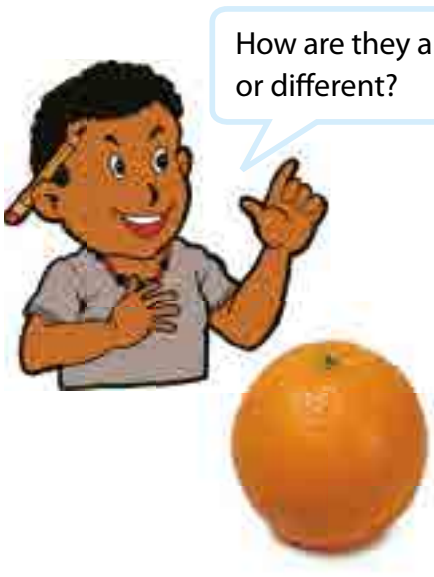
Activity : Describing matter

What to Do:

1. Make a table like the one shown on the right.

How they are similar	How they are different

2. Observe the pictures of two different matter below and find how they are similar or different.
3. Write the similarities and differences between the two matter in the table.
4. Share your can ideas with your classmates. Talk about how you can describe two different matter.



Orange

Basketball ball

Summary

A **property** is anything about a matter that we learnt. **Weight**, **size**, **colour** and **texture** are all properties of matter. Temperature, taste and smell are also properties of matter.

We can compare and describe matter by using our senses. **Sight, smell, hearing, touch and taste are our senses.**

We can see the size, shape and colour of a matter. We can touch a matter to tell how it is rough or smooth and hot or cold. We taste a matter to test if it is sweet, sour or bitter. We can also tell how a matter smells and sounds.

Size

Temperature

Colour

Taste

Shape

Lesson 3: "Heavy or Light?"

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

How can we compare the weight of different matter?

Activity : Comparing weight

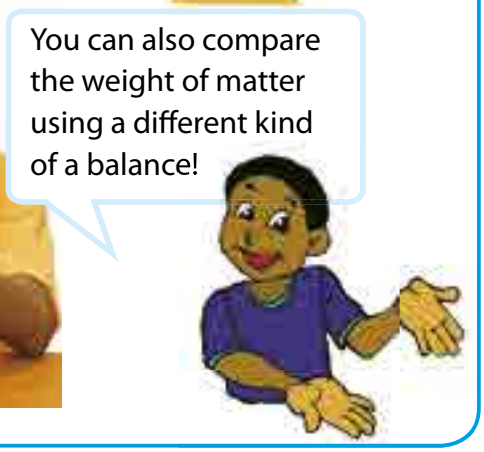
What We Need:

- 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.

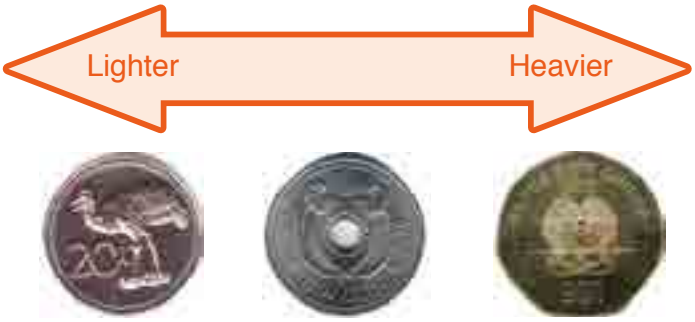
Coins	Which is heavier?
1kina and 50toea	
1kina and 20toea	
50toea and 20toea	



Result

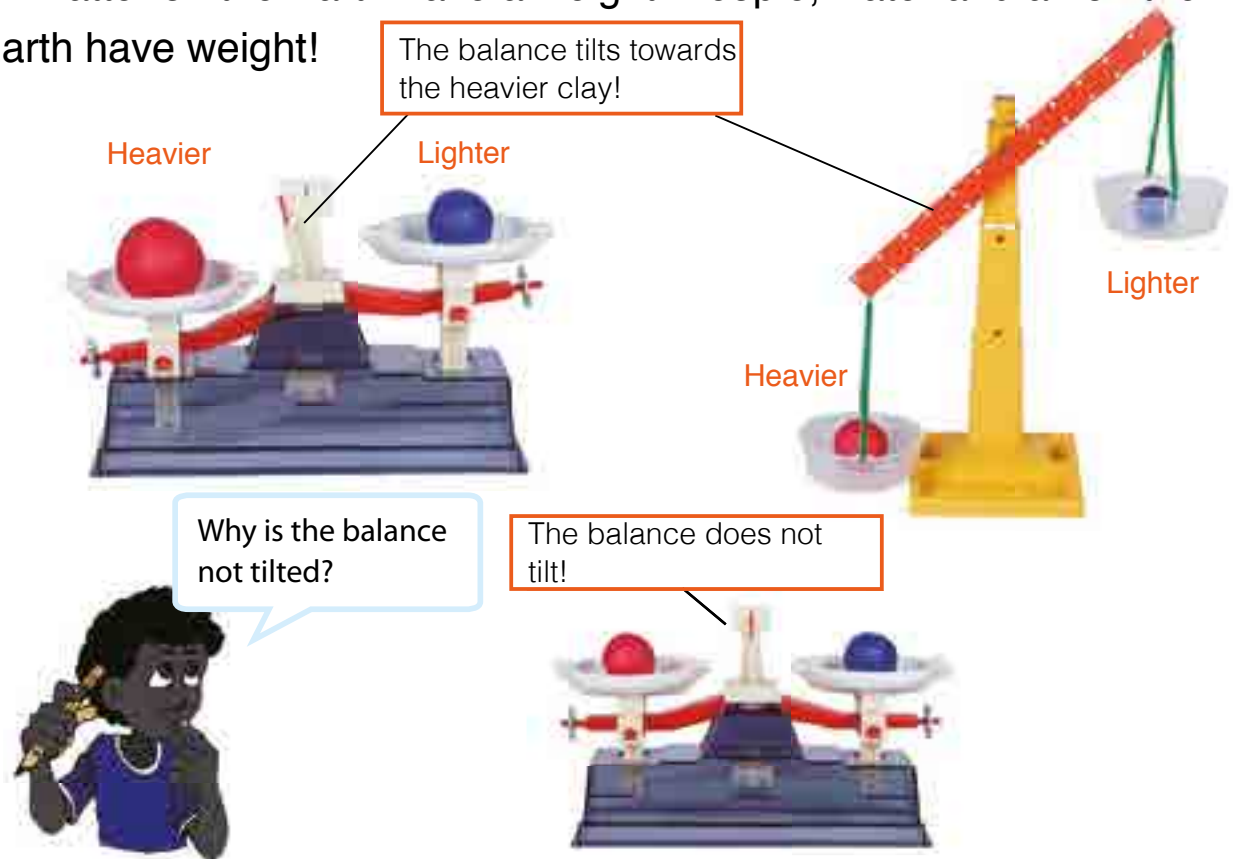
A 50 toea coin is heavier than a 1 kina coin. A one kina coin is heavier than 20 toea coin. A 50 toea coin is heavier than 20 toea coin. From this result, we found that 50 toea coin is the heaviest and 20 toea coin is the lightest among them.

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



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!



Lesson 4: "Big or Small?"

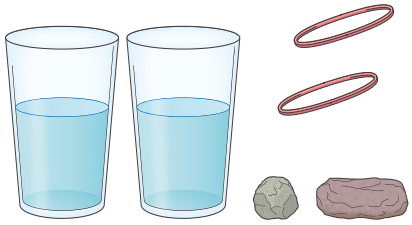
Size is a property of matter. Size means how big a matter is. Let's compare the size of matter!

How can we compare the size of matter?

Activity : Comparing the size of stones

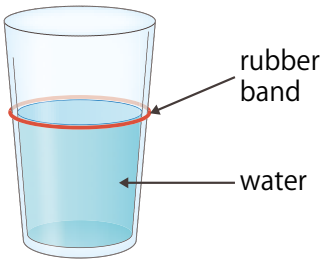
What We Need:

- two same kind of glass cups, water, rubber band, two different stones

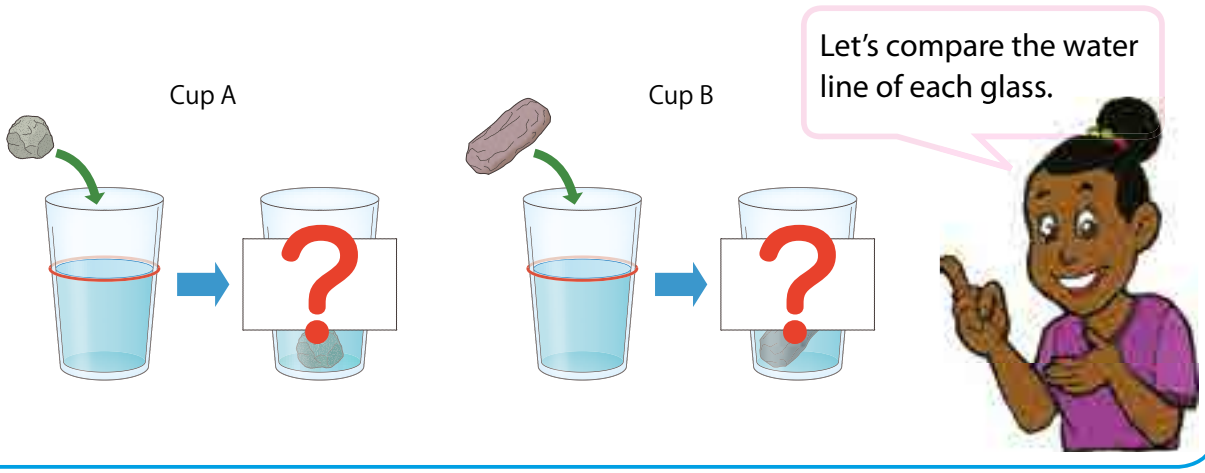


What to Do:

1. Observe the two stones and guess which one is bigger or smaller.
2. Pour water into the two glasses.
3. Set the rubber band at the same level of the water line on each glass as shown on the picture on the right.

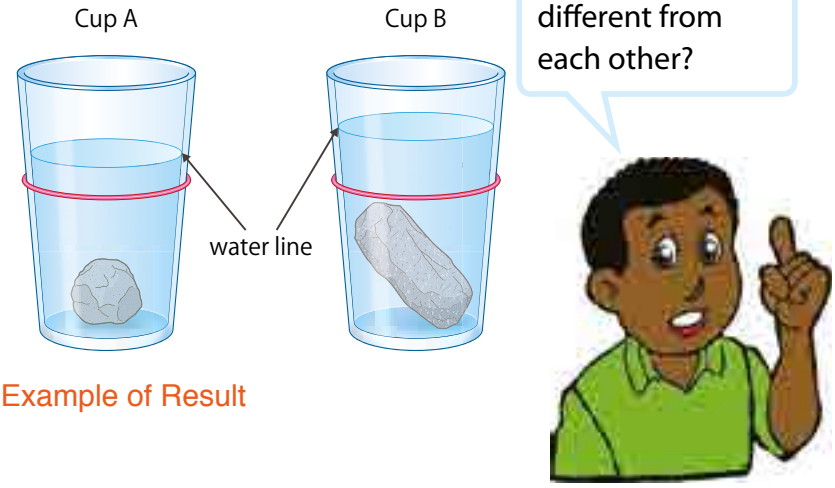


4. Place each stone into each glass slowly and observe what happens to the water line in each glass.
5. Share your ideas with your classmates. Talk about the size of the stone and increase in water level.



Result

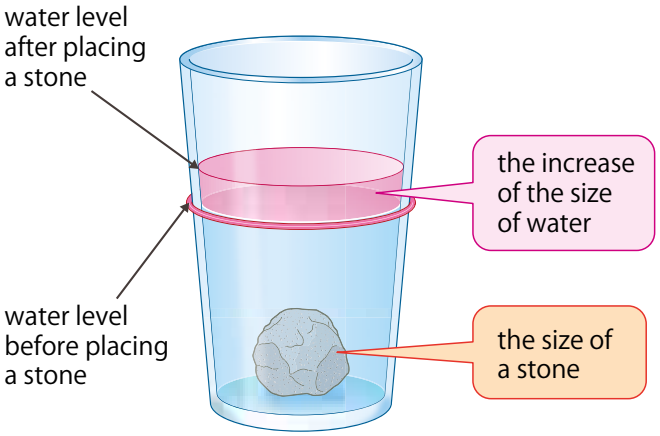
When we placed the stones into each glass, the water lines in the glasses rose. The water line of Cup B is higher than that of Cup A.



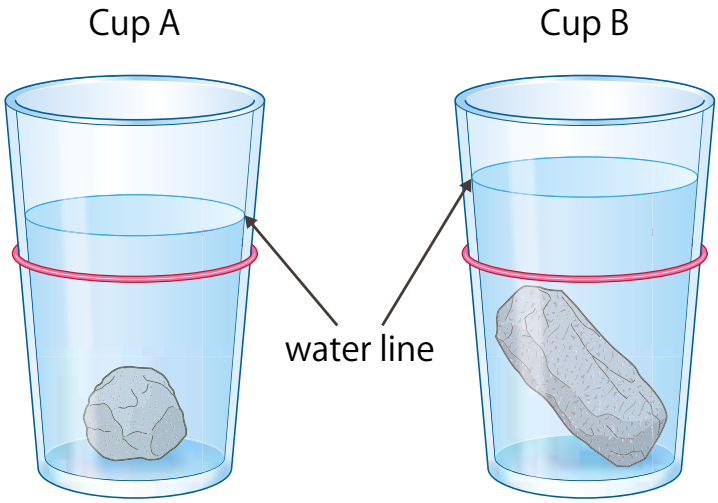
Example of Result

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.

Lesson 5: "Float or Sink?"

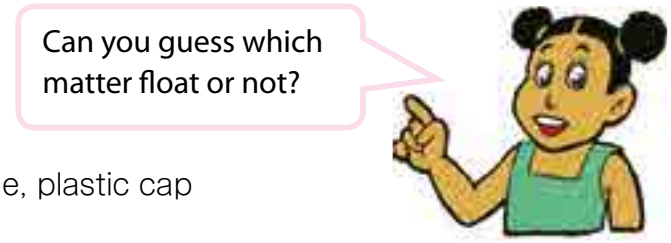
When we place matter in water, some float and others sink.

Which matter float or sink in water?

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

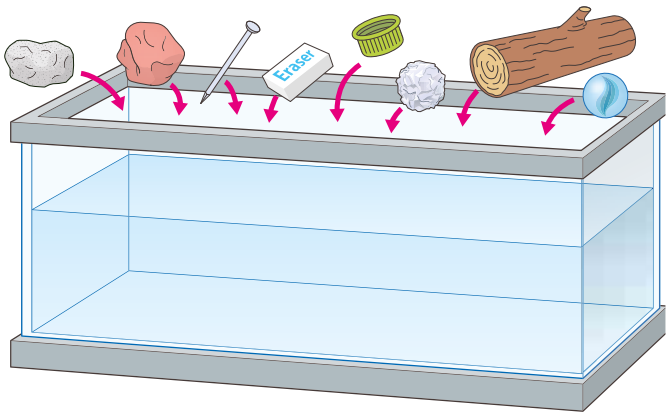


What to Do:

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.

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

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.



Result

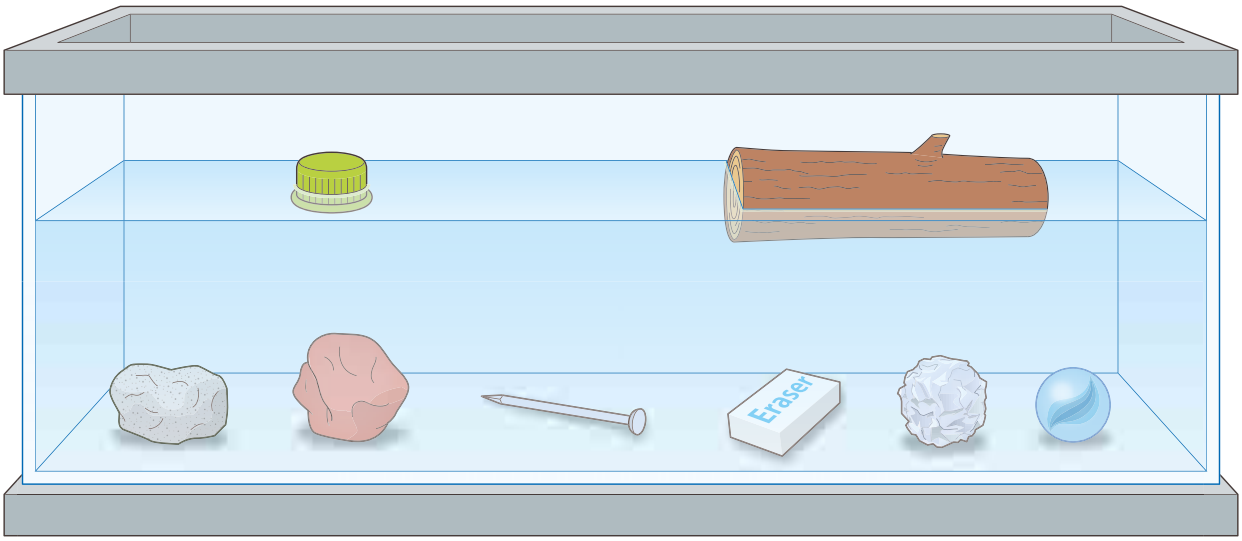
Wood and a plastic bottle cap can float on water. A stone, iron nail, clay ball, aluminium foil ball, eraser and marble sink in water.

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.



Some matter can float on water and some sink in water

Lesson 6: "What Matter Do We Use?"

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.

What kinds of matter do we use to make objects?

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?

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

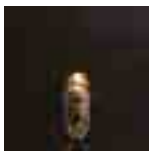

Plastic container

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.

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

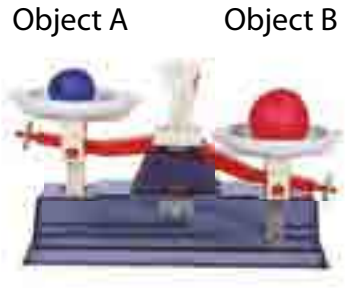
C. Sight

D. Smell

Q3. Answer the following question.

Look at the picture shown on the right.

Which object is heavier than the other?



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?

2.2 Measuring Matter

Lesson 1: "Taking Up Space"

Different matter have different properties. Size, colour and shape are the properties of matter. But, what is a common property of matter?

What is a common property of matter?

Activity : Space in a cup

What We Need:

- cups, pebbles, water

What to Do:

1. Put as many pebbles as possible into an empty cup. Observe the space inside the cup. Record your observations.
2. Fill an empty cup half-full with water. Observe the space inside the cup. Keep on pouring water into the cup. Observe the space inside the cup. Record your observations.
3. Share your ideas with your classmates.

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.

Other pebbles cannot take up the same space in the cup.

No water can take up the same space at the same time.

Lesson 2: "Measuring Volume of Water"

All matter have their own volume. Water also has its volume.

How can we measure the volume of water?

Activity : Measuring volume of water

What We Need:

- measuring jar, water

What to Do:

1. Pour some water into a measuring jar.
2. Measure the volume of water.
3. Share your ideas with your classmates. Talk about the measurement of the volume of the water.

Summary

Measuring cylinder, beaker, and measuring jar are used to measure the volume of water. Volume of water is often measured in **millilitre** (mL) or in **litre** (L).

Measuring jar

Beaker

Measuring Cylinder

• Science Toolbox •

Measuring Volume of Water

STEP 1:

Pour some water into a measuring container.

STEP 2:

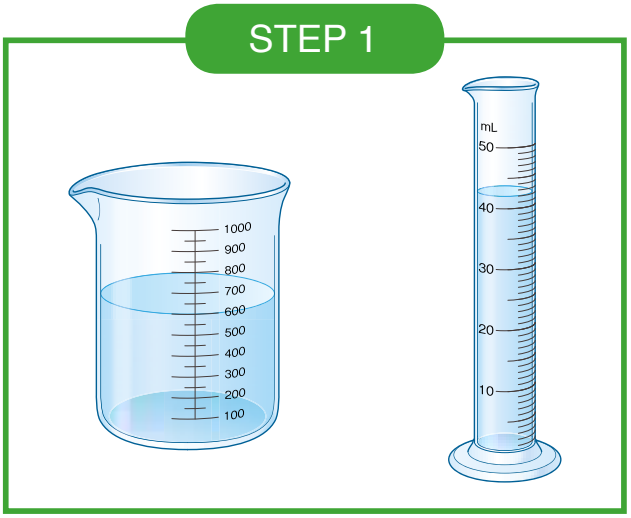
Position your eyes at the level with the top of the water. Read the scale line that is closest to the surface of the water.

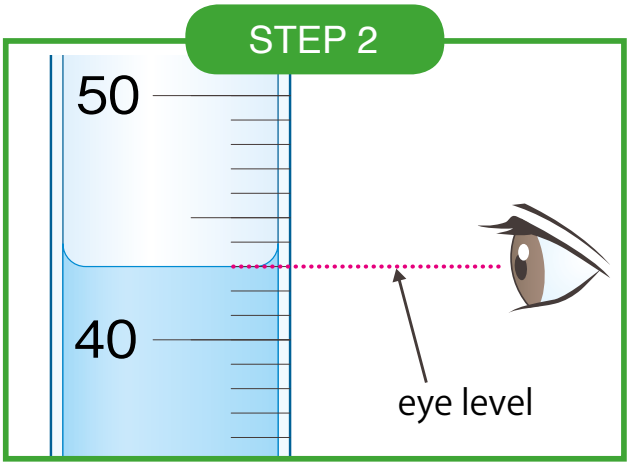
If the surface of the water is curved up on the sides, look at the lowest point of the curved water surface.

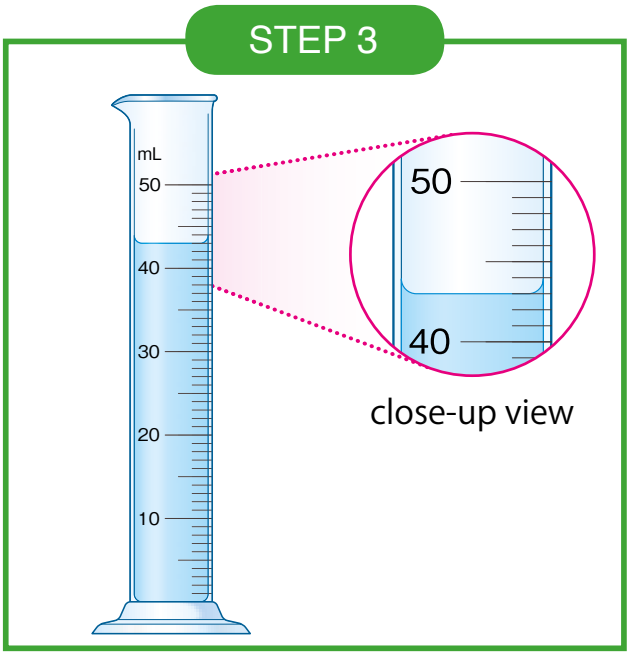
STEP 3:

Read the measurement on the scale.

The volume of water in the figure on the right is 43 mL.







Lesson 3: "Measuring Volume of Stone"

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

How can we measure the volume of a stone?

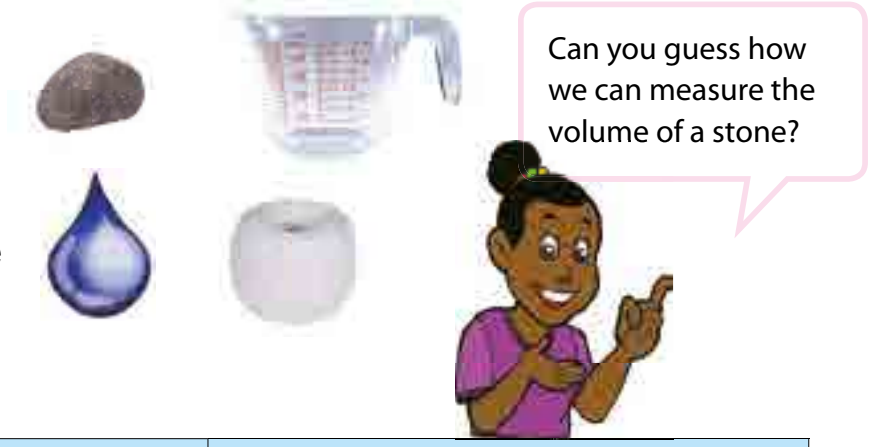
Activity : Measuring the volume of a stone

What We Need:

- stone, measuring jar, water, string

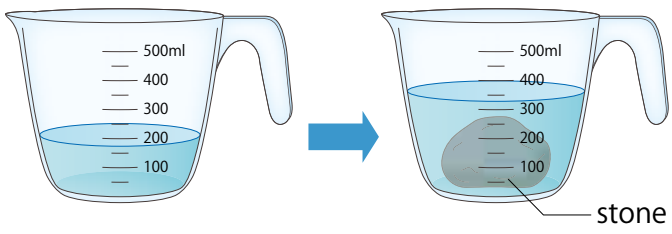
What to Do:

1. Make a table like the one shown below.



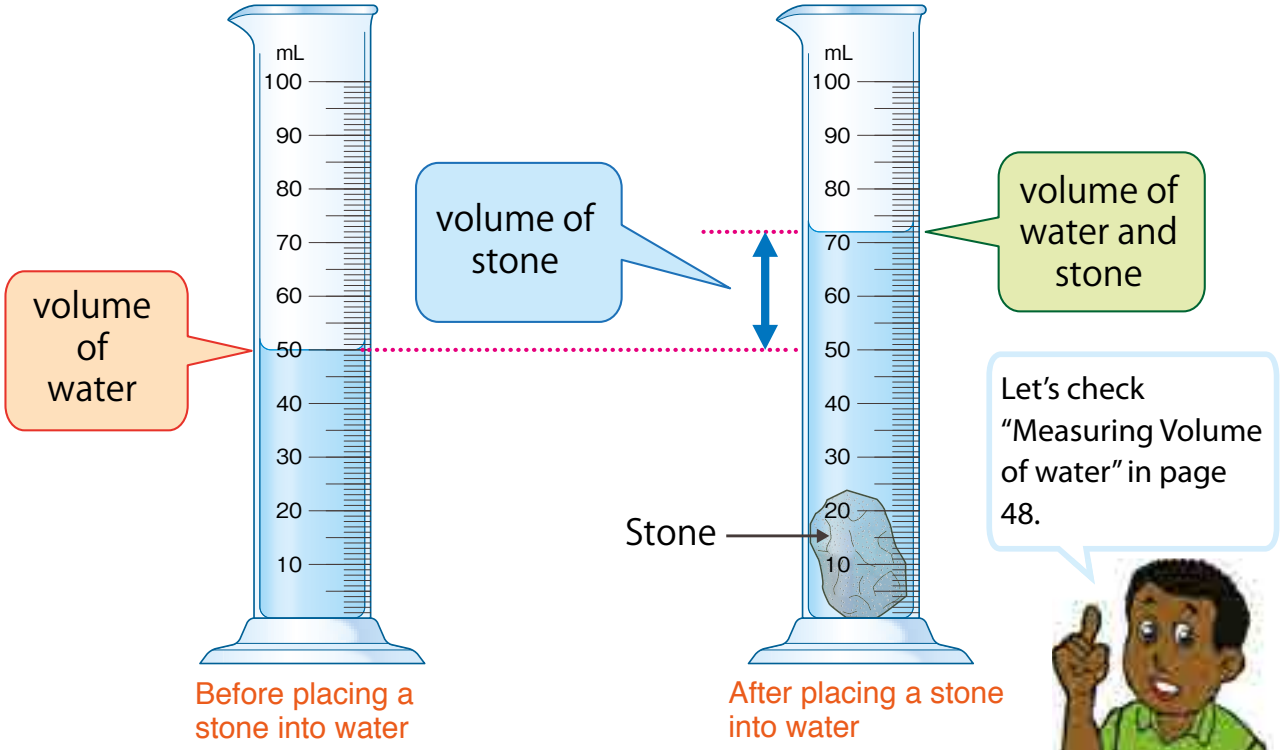
Objects	Volume (mL)
(1) Water	
(2) Water and Stone	
(3) Stone	

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.



Summary

We can measure the volume of a stone by using a measuring cup or cylinder, string and water. The volume of water in the measuring jar or cylinder increases when we place a stone into the water of the measuring jar or cylinder. The increase of the volume of water shows the **volume of the stone.**



We can calculate the volume of a stone as following:

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

The volume of the stone is measured in **cubic centimetres** (cm^3).

The volume of the stone in the figure above is:

$$\begin{pmatrix}\text{Volume of}\\ \text{Stone}\end{pmatrix} = \begin{pmatrix}\text{Volume of}\\ \text{Water and Stone}\end{pmatrix} - \begin{pmatrix}\text{Volume}\\ \text{of Water}\end{pmatrix}$$

$= 72\ mL - 50\ mL$

$= 22\ mL$

$= 22\ cm^3$

The volume of stone is $22\ cm^3$

Lesson 4: "Weight and Shape of Matter"

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

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

Activity : Comparing the weight of different shapes of clay

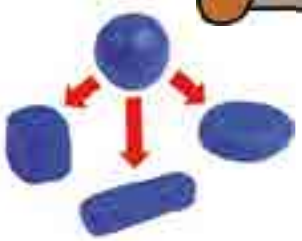
What We Need:

- a balance, equal weight of two clay ball

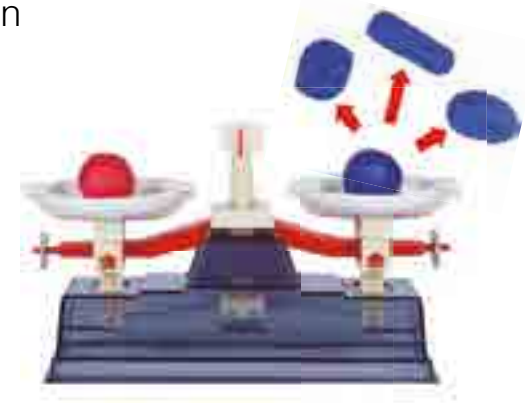
What to Do:

1. Make a table like the one shown below.

Shape	Which is heavier?

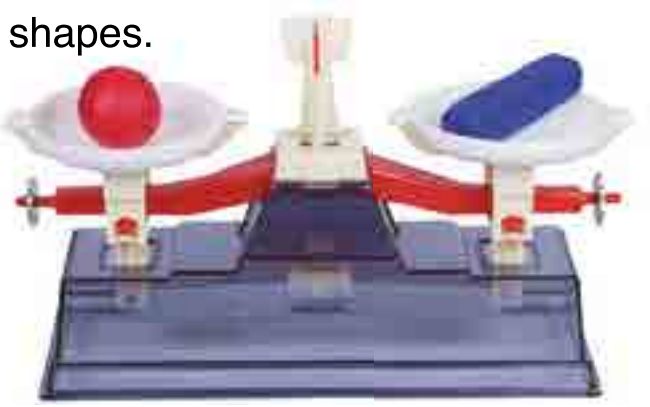


2. Change the shape of one of the clays and write the name of the shape in the table.
3. Compare the weight of the clay ball and the different shape of the clay with a balance and record your observation in the table.
4. Continue steps 2 and 3 with other shapes and observe what happens.
5. Share your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



Result

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

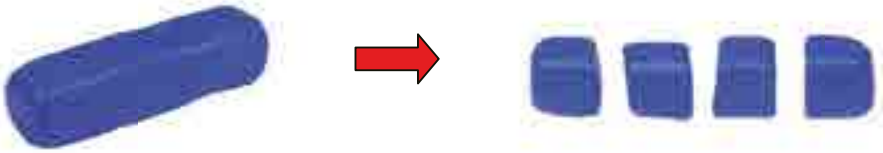


A balance is not tilted because the two clays have the same weight.

Discussion

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

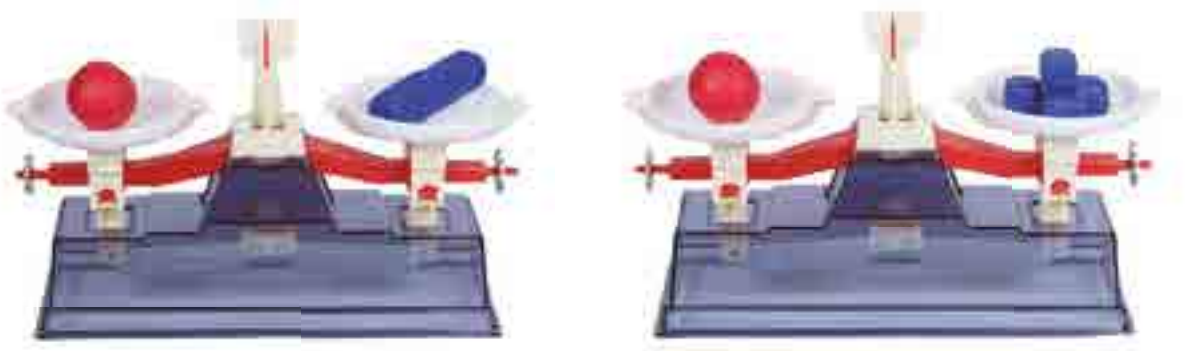
1. Think about the following question by yourself:
   - "If clay is divided into some small pieces, does the weight of the clay change?"



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.



Lesson 5: "Weight and Volume of Matter"

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

How can we compare the weights of different matter?

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?

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

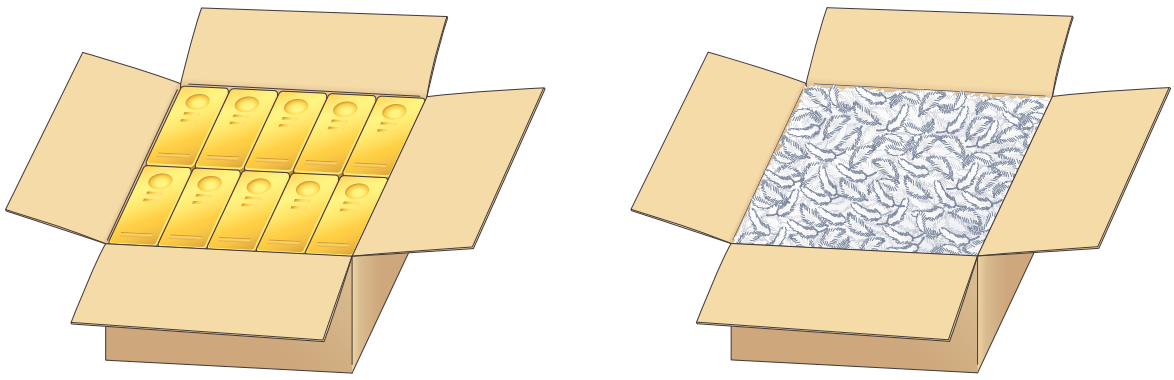
Comparing weight of sand and water

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.

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.

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 _____.

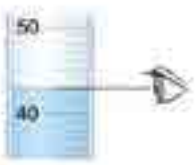
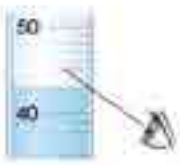
(4) Different kinds of matter with the same volume have _____ weights.

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.

2.3 Mixing Matter

Lesson 1: "Observing a Mixture"

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

What will happen when we mix different kinds of matter?

Activity : Let's mix different matter

What We Need:

- small stones, nails, paper clips, dried beans, a bowl

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.

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.

Lesson 2: "Separating a Mixture"

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

How can we separate a mixture?

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	

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.

Summary

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

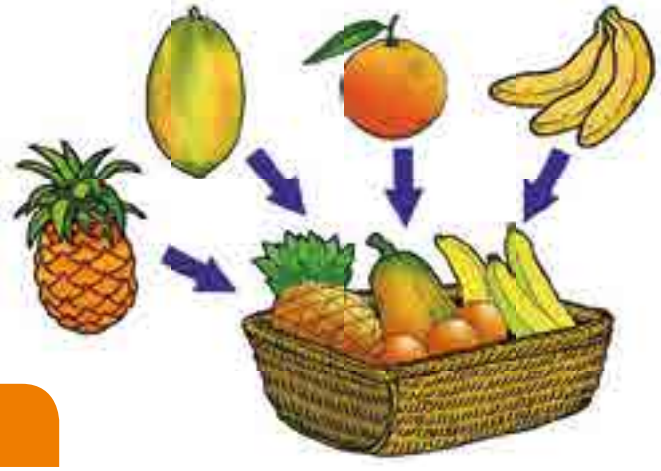
Some matter float in water, some sink in water. We can separate wood from the mixture by using water. Wood can float in water but nails and sand sink.

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.

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?

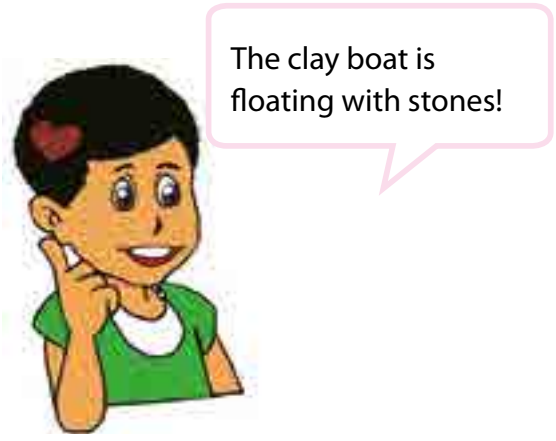
Q4. A boy drops rice grains on the ground. The rice grains are mixed with small pieces of wood and sand. How can he separate the rice grains from the mixture?

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?



Chapter Test

2. Properties of Matter

Q1

Complete each sentence with the correct word.

(1) _____ is everything around us.

(2) Matter can be described by their _____ such as colour, size and shape.

(3) _____ is how heavy or light a matter is.

(4) _____ is the amount of space matter takes up.

(5) Volume of water is often measured in _____ or _____.

(6) A _____ 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 <u>not</u> 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.

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?

_____

_____

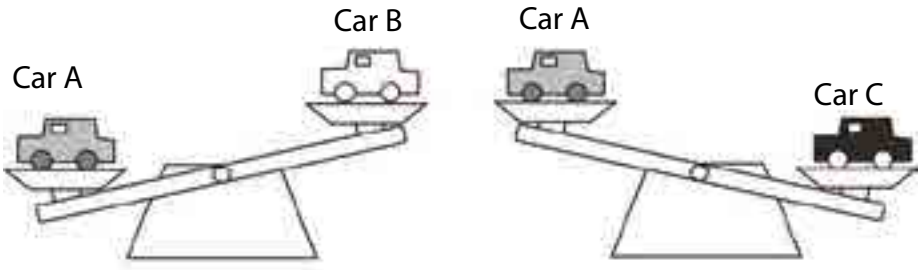
(2) A cup was placed under a dripping tap. After a while, water started spilling out. Why does the water spill out from the cup?

_____

_____

(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?

_____



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?

_____ mL

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

_____

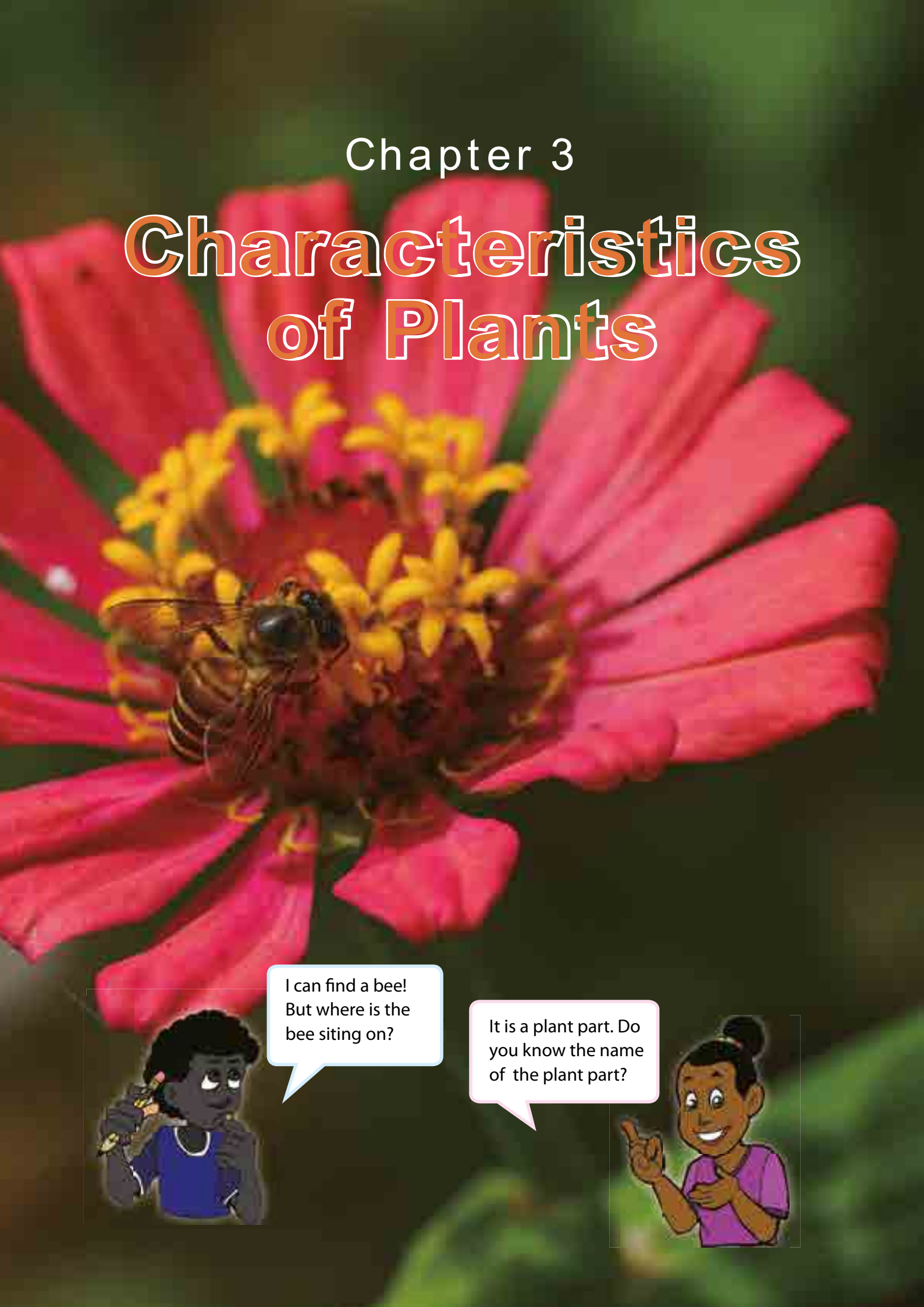
_____

c) What is the volume of stone?

_____ cm^3

Chapter 3

Characteristics of Plants



3.1 Observing Plants

Lesson 1: "Plants around Us"

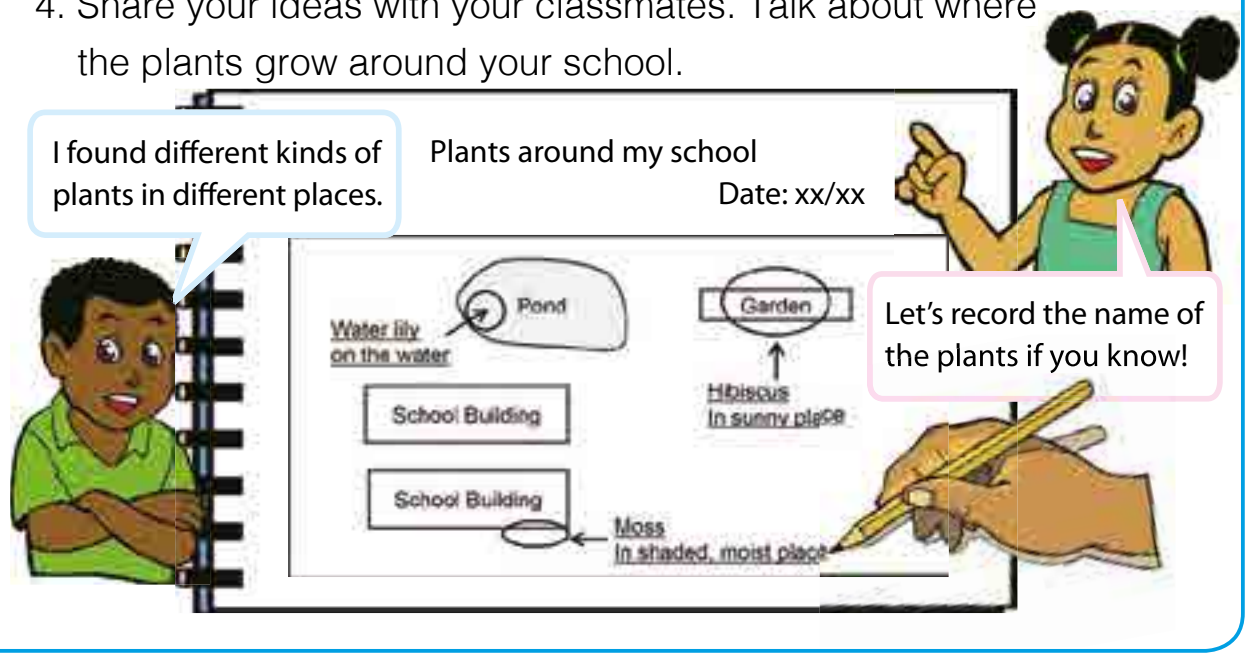
Look around us! There are many different kinds of plants around us. Where can we find plants?

Where do plants live and grow?

Activity : Finding plants around us

What to Do:

1. Draw a school map like the one shown below.
2. Go out of the classroom and find plants around your school.
3. Record the place where you found the plants and also describe the characteristics of the place such as sunny, shady, wet or dry on the map.
4. Share your ideas with your classmates. Talk about where the plants grow around your school.



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.

Lesson 2: "Observing Plant Parts"

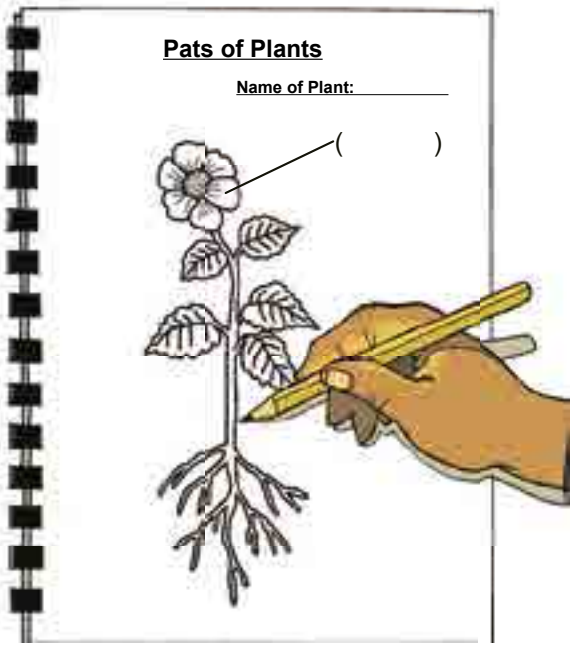
Even though there are so many different kinds of plants, most plants have some parts that are common.

How are the parts of plants common?

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.



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.

Different parts of a plant

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.

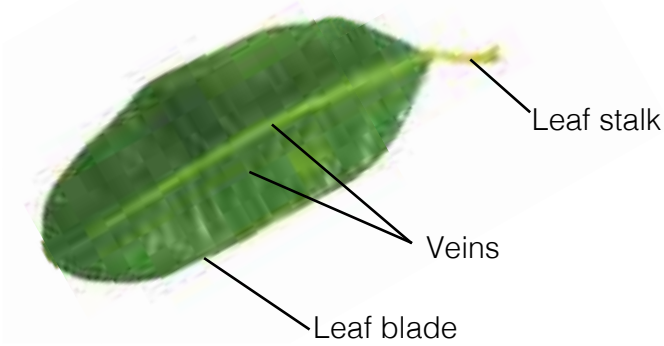
Roots hold a plant in the ground.

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.



A leaf stalk, a leaf blade and veins

Flowers

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

Different shapes, sizes and colours of flowers

Lesson 3: "Function of Plant Parts"

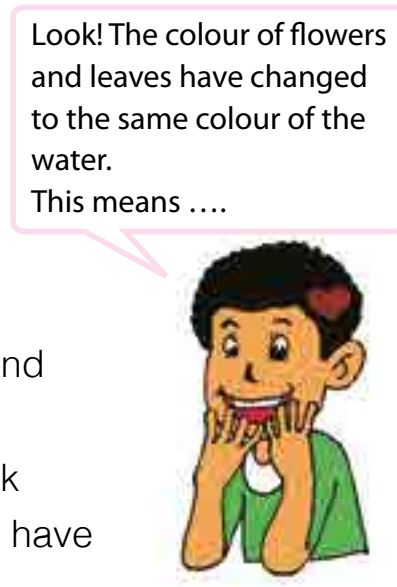
Plants are made up of different parts. Each plant part helps the plant in different ways.

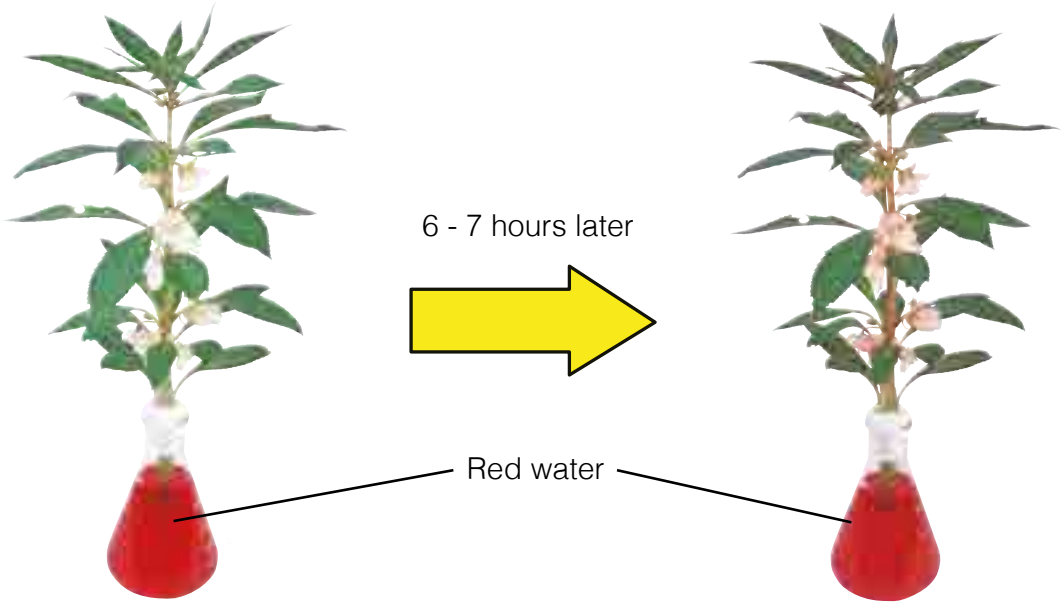
How do plants use their parts?

Activity : Function of a stem

What to Do:

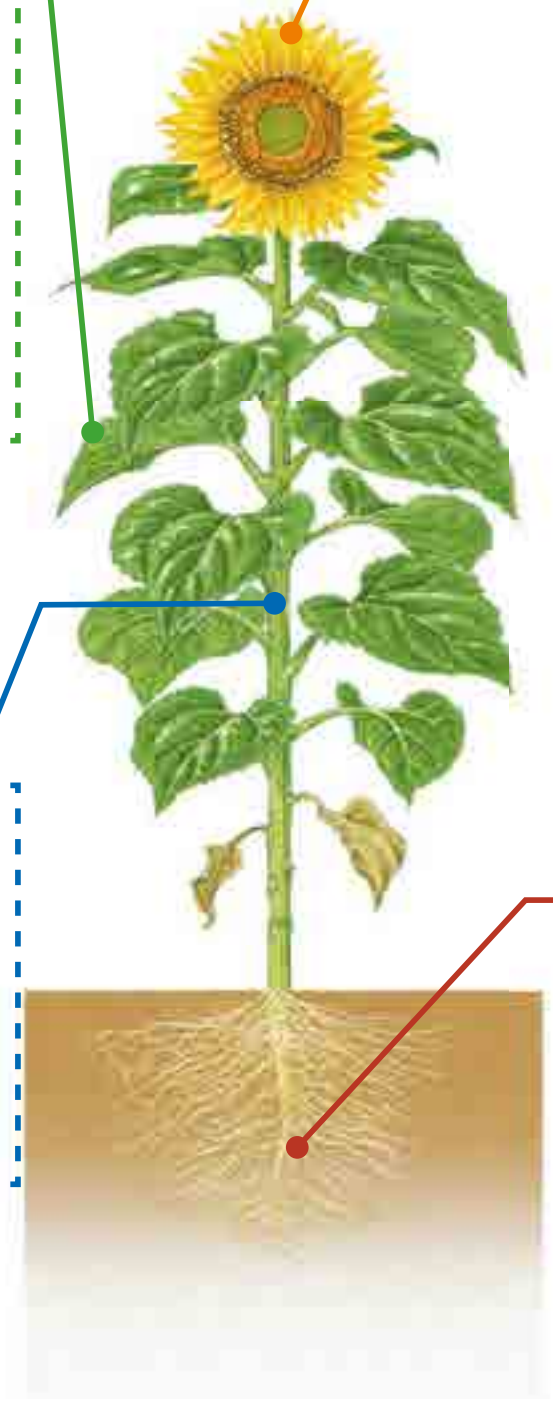
1. Look at the pictures below. A white flowered plant was placed into the red water (Picture A). After 6 - 7 hours, the colour of the flowers and leaves changed (Picture B).
2. Think about why the colour of the flowers and leaves changed to red.
3. Share your ideas with your classmates. Talk about why the colour of flowers and leaves have changed and how a stem works.





Summary

Plants use their parts to meet their basic needs. Each plant part has different functions.



Leaves

Leaves make food for the plants to grow. Leaves take in light energy from the sun to make plant food. Leaves also help take in and give off air.

Flower

A flower is a part of the plant that makes seeds. When a seed is planted, it will grow into a new plant.

Stems

A stem carries water and nutrients to other plant parts. It also helps hold up the plant and leaves.

Roots

Roots take in water and nutrients from the soil and hold the plant in the soil.

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.

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.

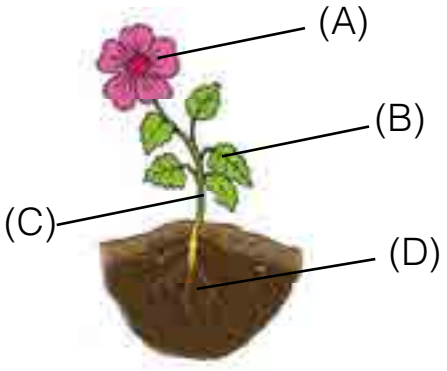
C. No plants grow in fresh water.

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?

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"

Most plants have roots. Different plants have different roots. How can we group plants by their roots?

? How can plants be grouped by their roots?

Activity : Comparing roots

What to Do:

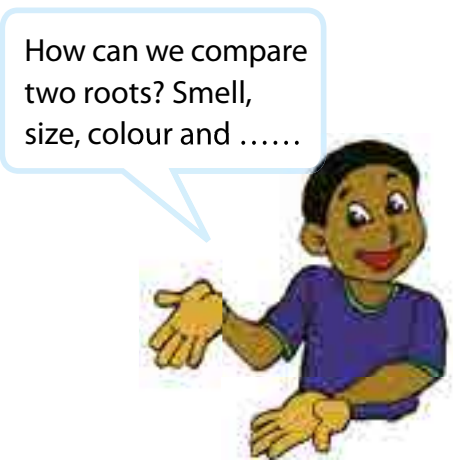
1. Make a table like the one shown below.

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.

Roots (A)

Roots (B)

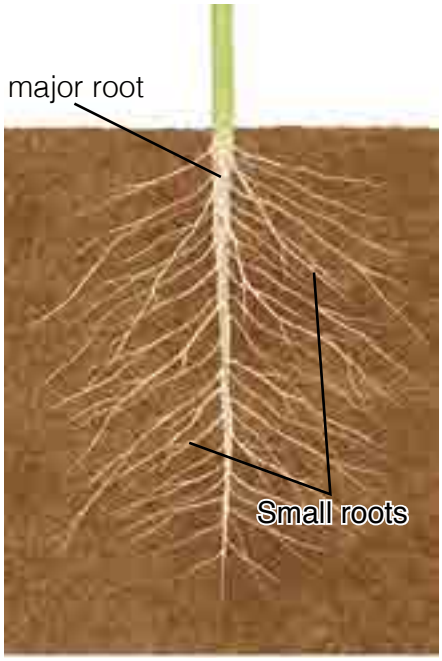


Summary

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.



Taproot

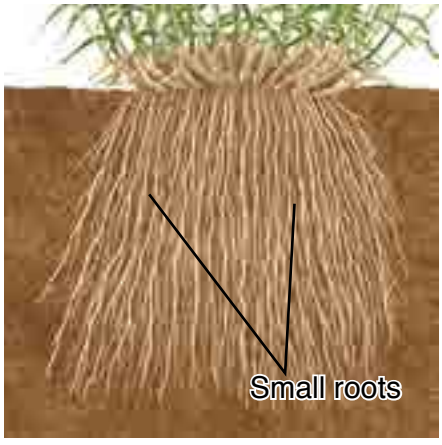
Examples of Taproots


Carrots


Bean

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.



Fibrous roots

Examples of Fibrous root


Onion


Corn

Lesson 2: "How to Group Plants: Stems"

A stem is a plant part. How are stems alike or different?

How can plants be grouped by their stems?

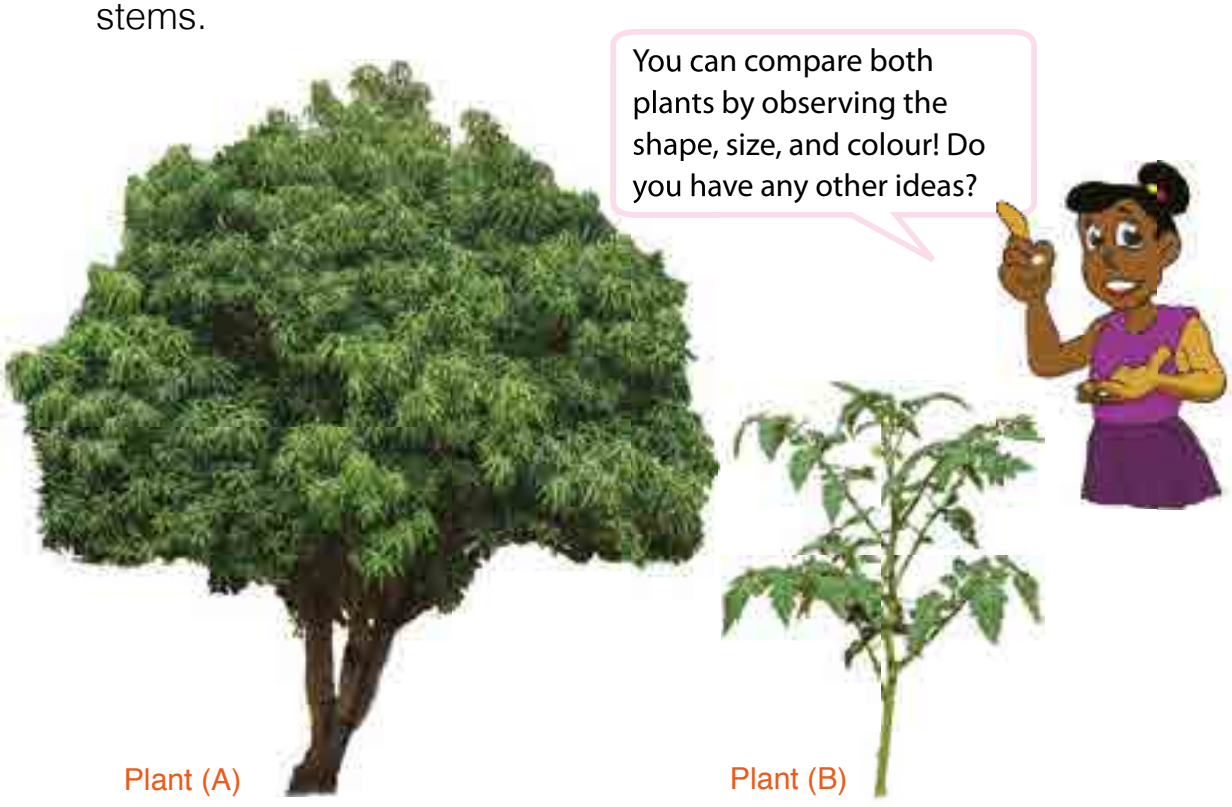
Activity : Comparing stems

What to Do:

1. Make a table like the one shown below.

How are they alike?	How are they different?

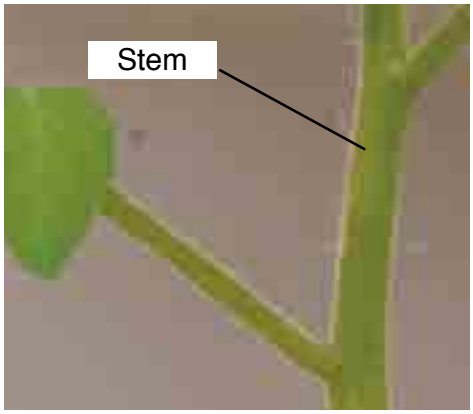
2. Look at the pictures below. Observe the stems of both plants and describe how their stems are alike or different in the table.
3. Share your ideas with your classmates. Talk about how stems are alike or different and how we can group plants by their stems.



Plant (A) Plant (B)

Summary

Plants can be grouped by their stems. We can group stems by their colour, hardness and size.



Stem of Tomato

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.

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.

Examples of Trees


Mango trees


Coconut trees

Examples of Shrubs


Hibiscus


Bougainvillea

Lesson 3: "How to Group Plants: Leaves"

There are thousands of different plants. Different plants have different leaves.

How can plants be grouped by their leaves?

Activity : Comparing leaves

What to Do:

1. Make a table like the one shown below.

How do you 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.

Summary

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

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
		

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?

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


Moss


Fungus


Seaweed

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 _____.

(2) _____ are part of a plant that makes food for the plants to grow by taking light energy from the sun.

(3) A _____ is a root that has many smaller roots that branch out in different directions.

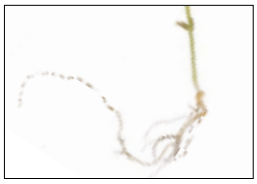
Q2

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.

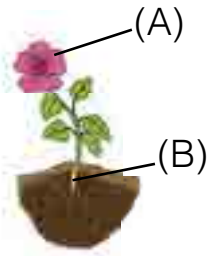
Q3

(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.

_____

_____

(2) Look at the plant picture on the right. Name and state the function of the part of plant A and B.



A. Name_____

Function_____

B. Name_____

Function_____

(3) Look at the picture of a plant leaf on the right. What do we call the type of veins in the picture?

_____

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
			

_____

_____

_____

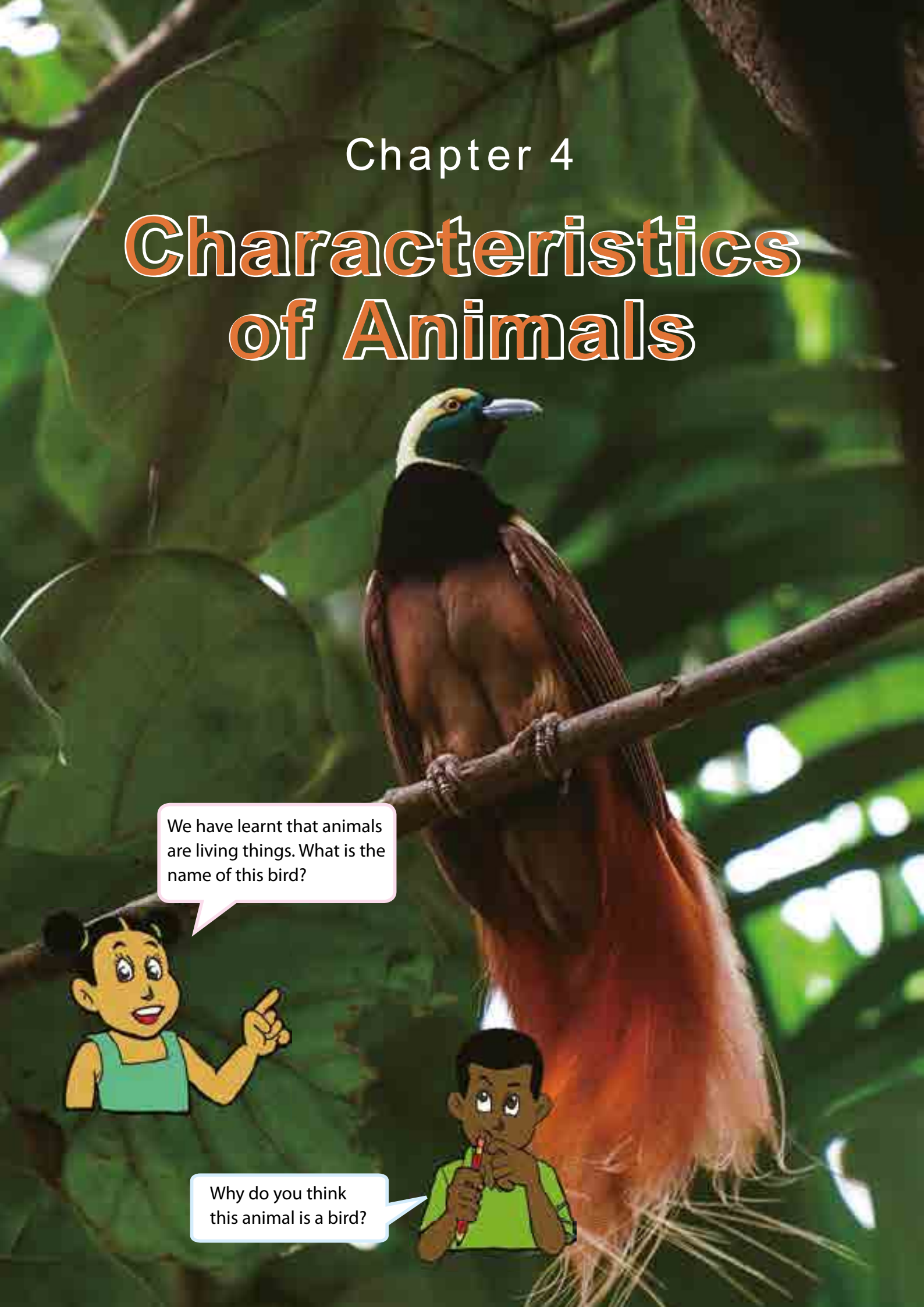
(2) Give an example of herbs and trees or shrubs found in your school, garden or at home.

Herb:_____

Tree or Shrub:_____

Chapter 4

Characteristics of Animals



4.1 Observing Animals

Lesson 1: "Animal Groups"

Look around you! There are many kinds of animals around us. What kinds of animals are there? How can we group animals?

How can animals be grouped?

Activity : Grouping animals

What to Do:

1. Look at the pictures of different animals below.
2. Group the animals based on your ideas. Record how you grouped the animals and the name of the animals in each group in your exercise book.
3. Share your ideas with your classmates. Talk about how you grouped the animals and the name of animals in each group.

Summary

We can group animals by their similarities. Some animals have similar body covering. Some have similar body parts. There are many ways to group animals but animals usually can be grouped as **insects**, **fish**, **amphibians**, **reptiles**, **birds** and **mammals**.

Insects


Fish


Reptiles



Birds


Amphibians

Mammals



Lesson 2: "Observing Insects"

Animals can be grouped by their similarities. All animals in the same group have some common characteristics.

What common characteristics do insects have?

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.

Let's observe the body parts of insects! What parts do insects have?

Do all insects have the same number of legs or not?

Summary

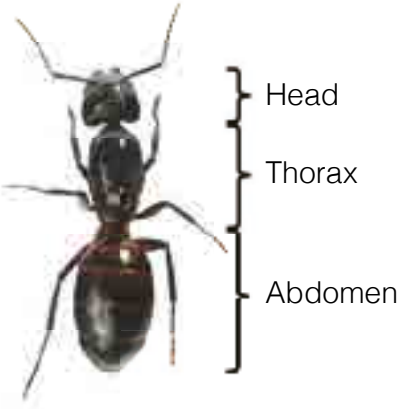
Butterfly, bees, dragonfly, grasshopper and ants are examples of insects. They have some common characteristics of body parts.

Legs

Insects have three pairs of legs (Six legs).

Body Parts

All insects have three parts; the head, the thorax and the abdomen.

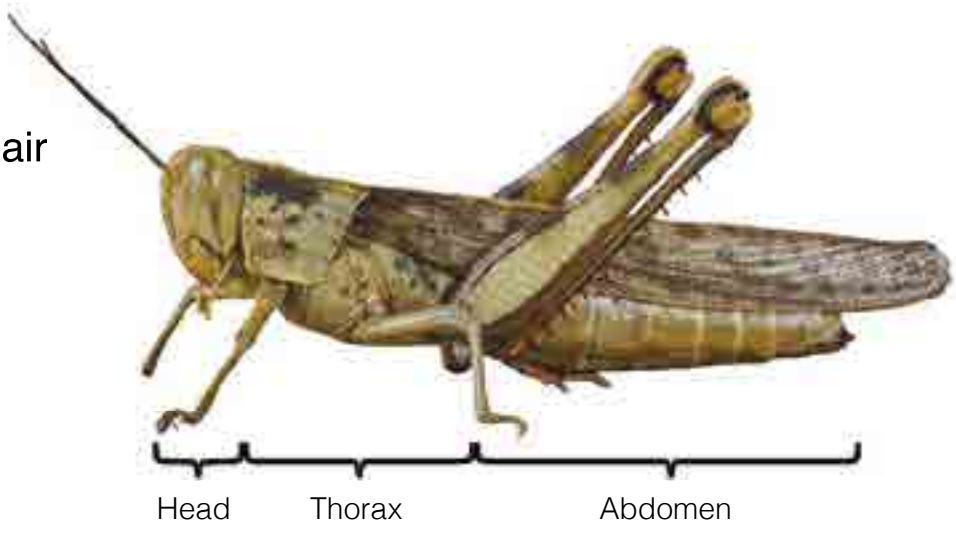


Body Covering

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

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.

Lesson 3: "Observing Fish"

Fish is one of the animal groups. How are fish similar?

What characteristics do fish have in common?

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.
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……

Summary

All fish have some similar characteristics.

Fins

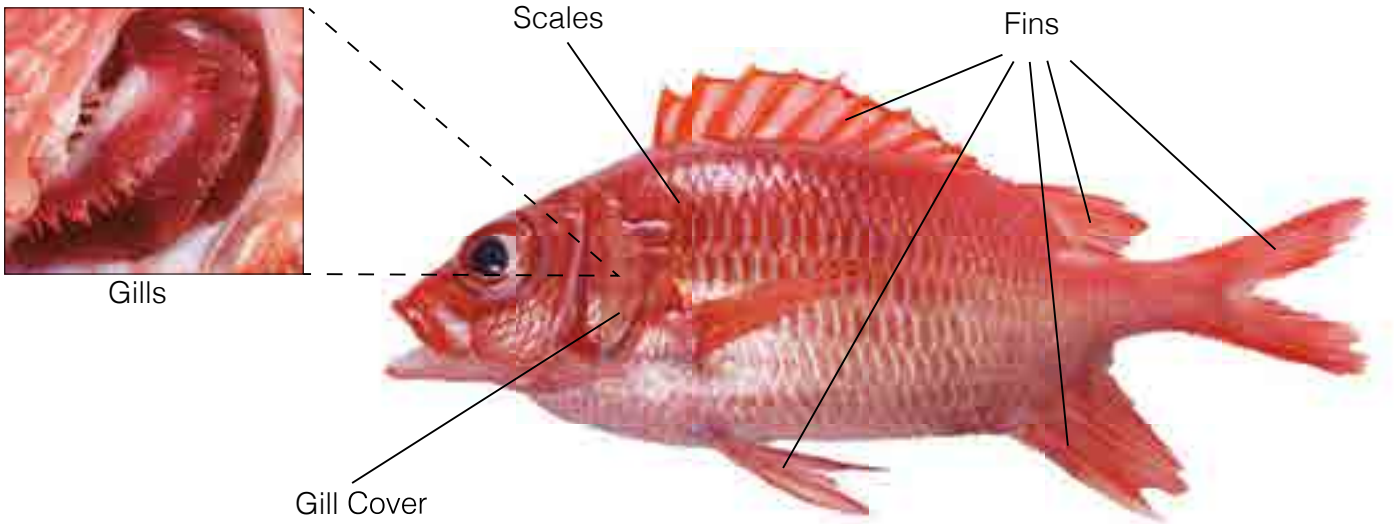
Fish live in fresh or salt water. Fish do not have legs, but they have **fins**. Fins help fish swim in water.

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

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.

Lesson 4: "Observing Amphibians"

Frogs are examples of amphibian. What characteristics do amphibians have?

What characteristics do amphibians have in common?

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.
3. Share your ideas with your classmates. Talk about the characteristics of a frog.

Summary

All animals in the group of amphibians have similar characteristics. Frogs, newts and salamanders are examples of amphibians.

Living Places

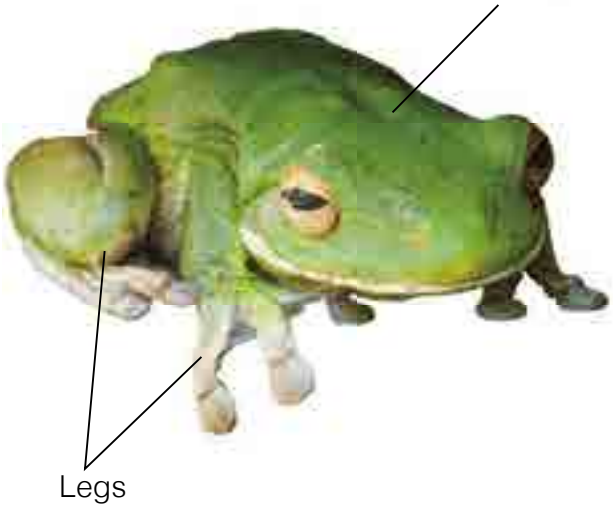
Amphibians can live in water and on land.

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.



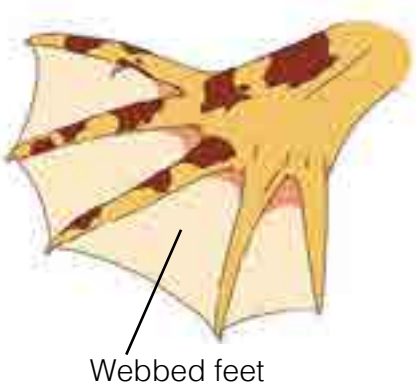

Newt


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.



Lesson 5: "Observing Reptiles"

Reptiles are one of the animal groups. Lizards, crocodiles and turtles are examples of reptiles. How are they alike?

What characteristics do reptiles have in common?

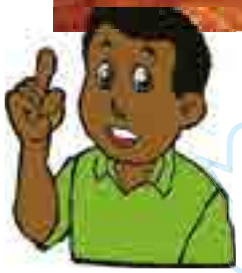
Activity : Observing lizard and crocodile

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?		

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?

Summary

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.

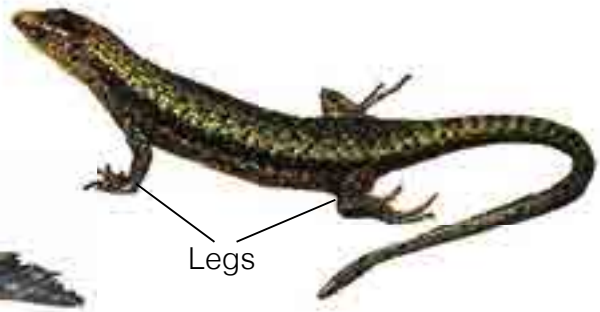
Legs

Most reptiles have four legs. Some do not.

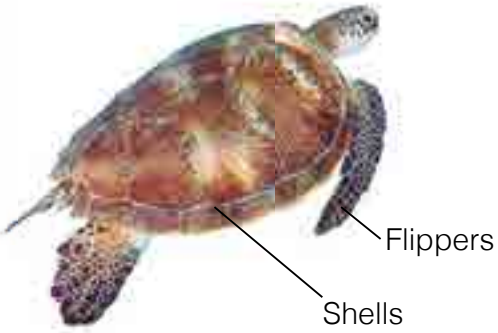
Reptiles have dry skin with scales.

Body Covering

Reptiles have **dry skins** that are usually covered with **scales**. Some reptiles have **shells**.



Most reptiles have four legs.



Sea turtle have shells.

Discussion

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.

Lesson 6: "Observing Birds"

The bird of paradise and the cassowary are examples of birds. How are they alike? What characteristics do they have?

What characteristics do birds have in common?

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?	

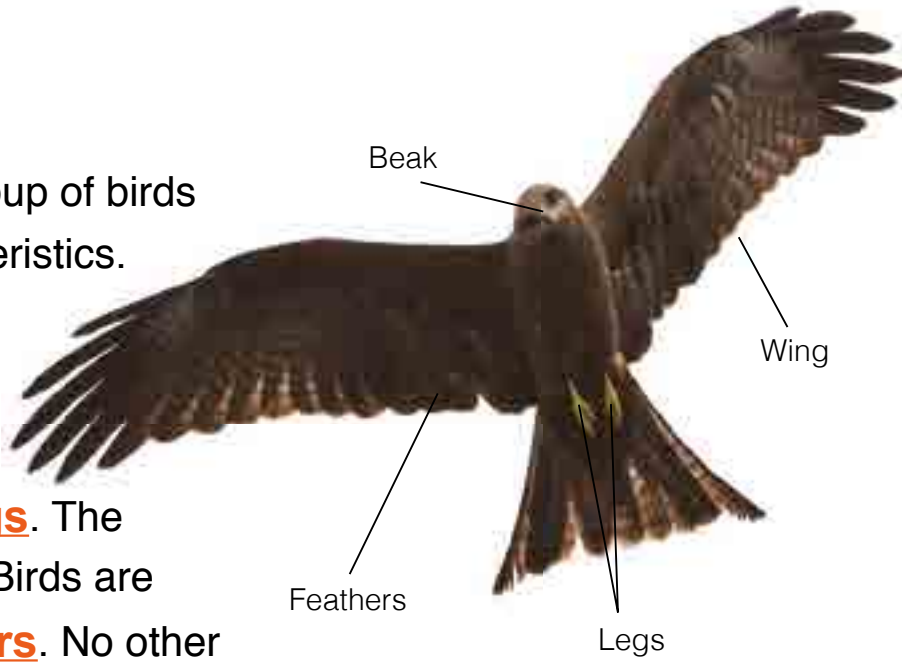
2. Observe the pictures of birds shown below. Find their common characteristics and write your findings in the table.
3. Share your ideas with your classmates. Talk about the common characteristics of birds.

Bird of paradise

Egret

Let's observe the body parts of birds! How do they move? What part do they use for eating?

Summary



All animals in the group of birds have similar characteristics.

Breathing

All birds breathe air.

Wing and Feather

Birds have two **wings**. The wings help birds fly. Birds are covered with **feathers**. No other animal has feathers.

Leg and Beak

Birds have two legs and a **beak**. A bird's beak shows how the bird eats. Some birds have a curved beak that helps them to eat seeds or fruits. Some have a long beak that helps gather nectar from flowers.

Different Types of Beak

Discussion

How does a beak help birds?

1. Think about the following question:
   - "Ducks live in lakes or ponds. They have wide flat beak. How does the beak help ducks?"
2. Share your ideas with your classmates.

A duck has a wide flat beak.

Lesson 7: "Observing Mammals"

Human beings, pigs, dogs and tree kangaroos are some examples of mammals. How are they alike?

What characteristics do mammals have in common?

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

Summary

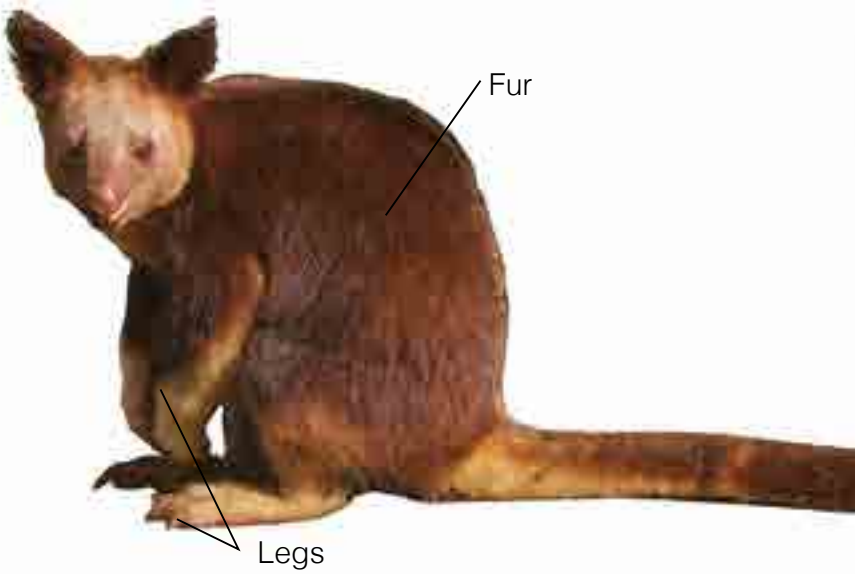
Animals in the group of mammals have some common characteristics.

Body Covering

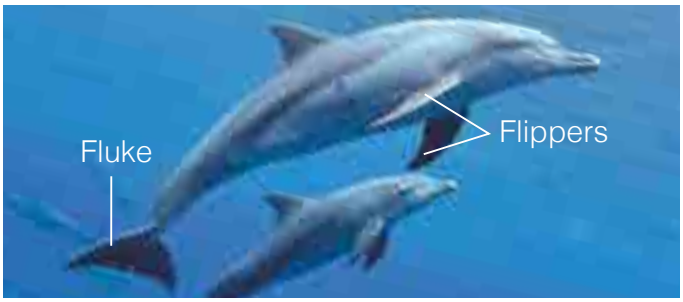
Most mammals have fur. Some mammals have hair.

Body Parts

Most mammals have legs. Some mammals such as dolphins and whales have flippers and flukes instead of legs.



A tree kangaroo has fur and four legs.



A dolphin has flippers and fluke.

A whale is a mammal. It breathes air with lungs.

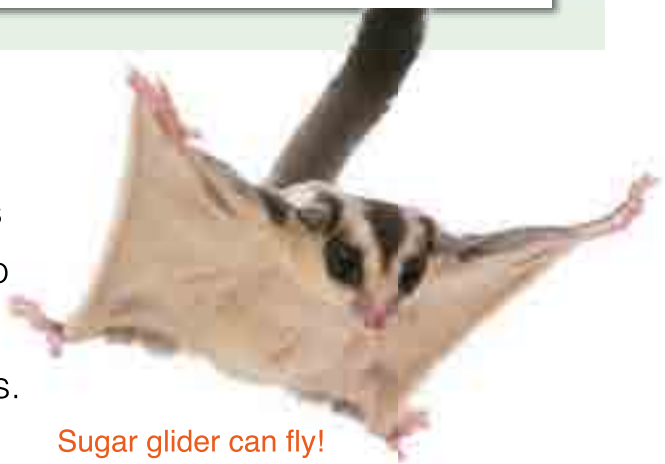
Breathing

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.

Discussion

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!

Lesson 8: "Animal Body Parts and Their Uses"

Animals in each animal group have common body parts. Let's summarise animal body parts and study how animal body parts help animals.

How do animals use their body parts?

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.
3. Share your ideas with your classmates.
   Talk about how animals use their body parts.





Summary

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.

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.

Senses and body parts

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.

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.

Biggest and Smallest in the World

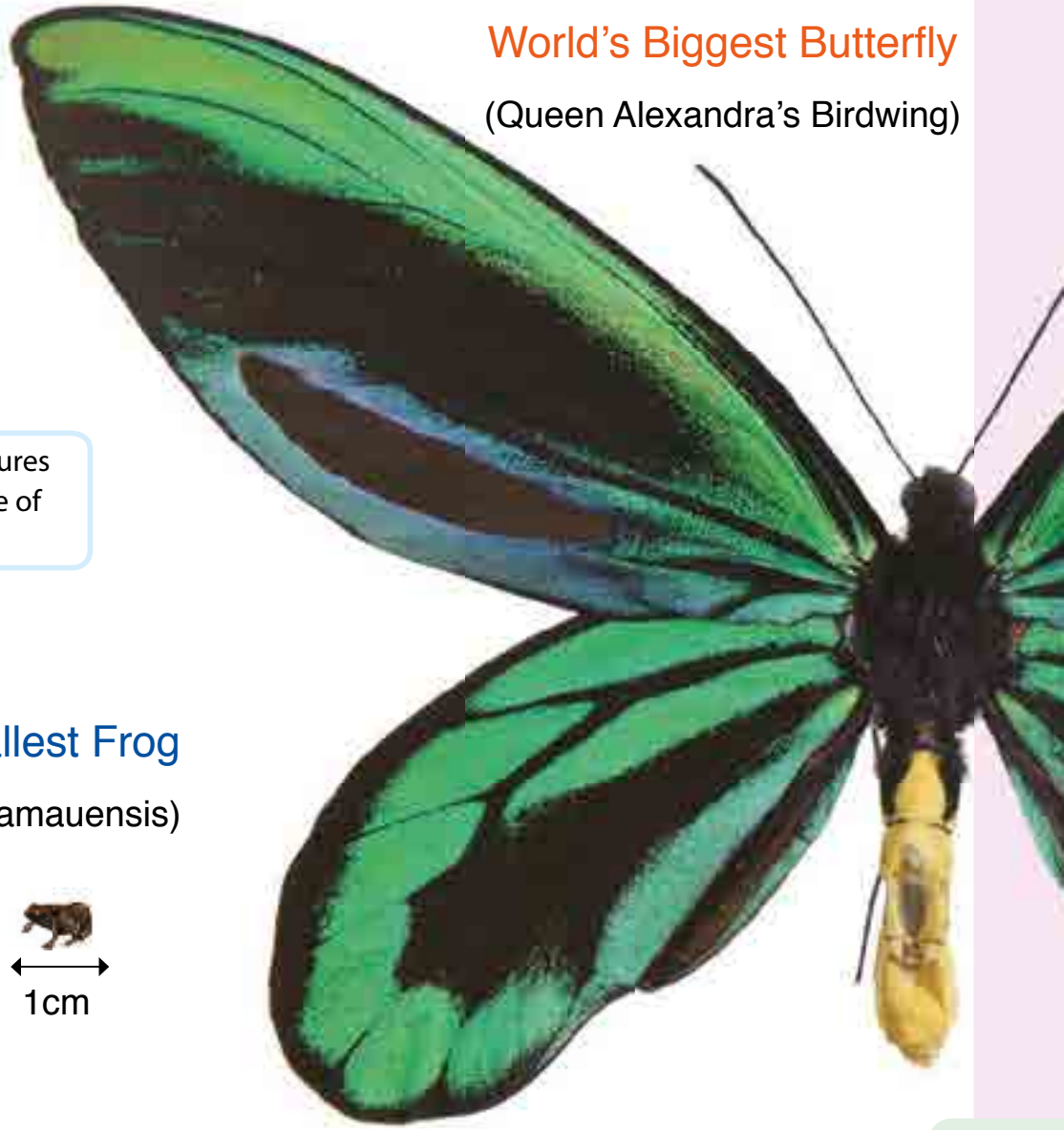
Various kinds of animals live in the forest of our country, Papua New Guinea. The world's biggest butterfly is found in Oro Province. The world's smallest frog was discovered in Abau in Central Province.

The world's biggest butterfly's wingspan can reach up to 28cm, which would be larger than your face. On the other hand, the world's smallest frog is less than 1cm, the same size as your finger nail. Both animals are only found in our country.

The size of this pictures is near to actual size of the animals.

World's Biggest Butterfly

(Queen Alexandra's Birdwing)



World's Smallest Frog

(Paedophryne amauensis)

1cm

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 _____.

(2) An animal that has skin covered with dry scales is called _____.

(3) An animal that has hair or fur and four legs is called _____.

(4) An animal that has wings, feathers and beak is called _____.

(5) Toads belong to _____ 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

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.

_____

_____

_____

(2) A dolphin has been under water for a long time. Predict what will happen.

_____

(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

Q4

(1) Look at the picture of a crab on the right:
Is a crab an insect? Give your reason.

_____

_____

_____

(2) What would you need to think about to care for a pet frog?

_____

_____

Chapter 5

Energy

What is this?

We learnt that fire is not a matter. It is one of the types of energy. What is energy?

5.1 Energy around Us

Lesson 1: "Energy"

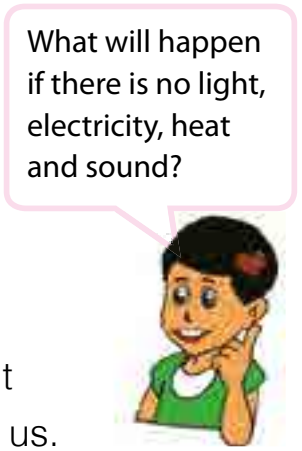
Have you heard about energy? Energy is everywhere around us. When we play rugby, watch television or cook food, energy is happening all around us.

What is energy?

Activity : What if there is no energy?

What to Do:

1. Think about the following questions:
   - What will happen if we cannot use light?
   - What will happen if we do not have electricity?
   - What will happen if we cannot use heat?
   - What will happen if we cannot hear sound?
2. Share your ideas with your classmates. Talk about how light, electricity, heat and sound energy help us.



Summary

Energy is the ability to do work. Energy can change and move things. It can also make things happen. For example, heat is energy. When we light a candle, heat from the flame melts the candle. Light is also energy. When we turn on the room light, the light makes the room bright.

There are many different types of energy around us. The following are some examples of energy.

Light Energy

Light is energy that we can see. Without light, we cannot see the things around us. We get the powerful light energy from the sun.

Electrical Energy (Electricity)

Electricity is energy that we use to run electric appliances. Electricity comes from batteries or power points in a house.

Heat Energy

Heat is energy that makes things warm. We get heat energy from burning something or rubbing two things together such as our hands. The powerful heat energy also comes from the sun.

Sound Energy

Sound is energy that we hear. Sound is all around us. We make sound when we talk or sing. Music is made of sounds that are produced.

Lesson 2: "Uses of Energy"

Energy is everywhere around us. We need energy for our daily life.

How do we use energy in our daily life?

Activity : How people use energy

What to Do:

1. Look at the picture below. Find light, heat, sound and electric energy in the picture.
2. Write the name of the energy you found and the ways that people use the energy in your exercise book.
3. Share your ideas with your classmates. Talk about how people use the energy in their daily life.

Summary

Energy is important for us. We use energy in many ways.

Light Energy

We use light energy to make a room bright. Light energy is also used in traffic lights to control the flow of traffic and to guide airplanes taking off and landing.

Electrical Energy (Electricity)

We use electricity almost everywhere. Electricity is used to turn on the light bulb, watch Television, listen to the radio and play with a toy car.

Heat Energy

Heat energy makes us warm or hot. We use heat energy to cook food, dry clothes and keep us warm.

Sound Energy

Sound is used to communicate with others. An ambulance uses a siren to warn us of an emergency. We make sound as music when we sing or when musical instruments are played.

Summary and Exercise

Summary 5.1 Energy around Us

Energy

- ☑ Energy is the ability to do work.
- ☑ Energy can make things move and change.
- ☑ There are many different types of energy around us.

Light	Electricity	Heat	Sound
			
Light is energy that we can see.	Electricity is energy that we use to run electric appliances.	Heat is energy that makes things warm.	Sound is energy that we can hear.

Uses of energy

- ☑ Energy is used in many ways.
  1. Light energy is used to make a room bright and is used in traffic lights to control the flow of traffic.
  2. Electrical energy is used to make electrical appliance work.
  3. Heat energy is used to cook food, dry clothes and keep us warm.
  4. Sound energy is used to communicate with others.

Summary and Exercise

Exercise 5.1 Energy around Us

Q1. Complete the sentence with the correct word.

(1) _____ is the ability to make things work.

(2) Energy comes in different _____.

(3) A fire made to keep us warm gives off _____ energy.

(4) _____ energy helps us to see in the dark.

Q2. Choose the letter with the correct answer.

(1) Which of the following does <u>not</u> use electrical energy?

A. Torch

B. Traffic lights

C. Candle flame

D. Mobile phone

(2) Which sentence is <u>not</u> true about energy?

A. Heat is energy that makes things warm.

B. Heat energy can be produced from rubbing our hands together.

C. The heat energy also comes from the sun.

D. Fire is the only source of heat energy.

Q3. Answer the following question.

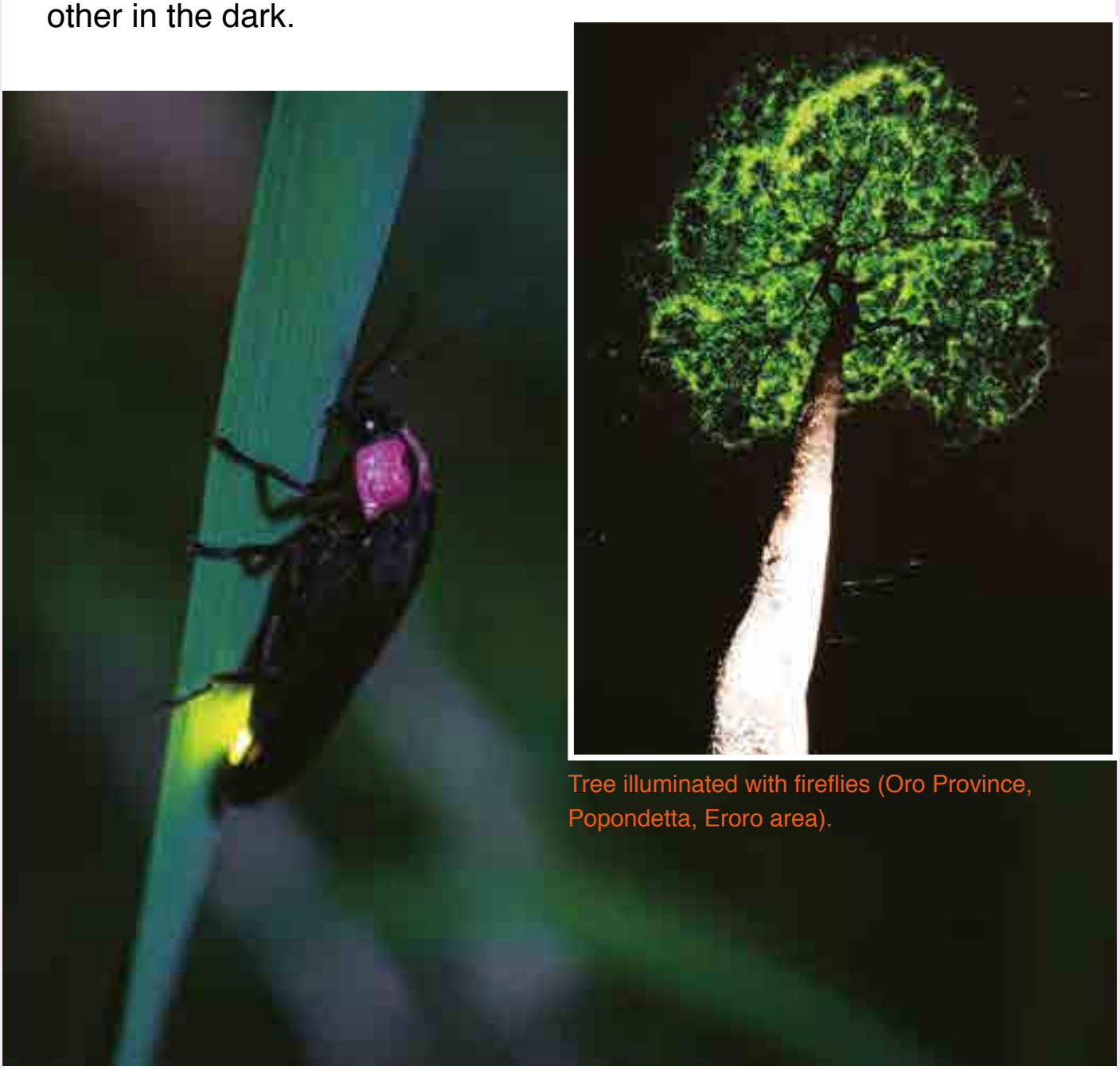
What form of energy is used to cook food?

Q4. The ambulance during an emergency produces a large volume of sound as a siren. What would happen if there was no sound from the ambulance?

Animals producing light energy inside their body

Can any part of your body produce light? It is impossible for human to do that. But some animals are able to light up their body parts using the light energy produced inside their bodies.

Fireflies are insects that can light up their body part. Why do fireflies light up? They use their light to signal and communicate with each other in the dark.



Tree illuminated with fireflies (Oro Province, Popondetta, Eroro area).

Fireflies produce light energy inside their body to light up their body part.

Chapter Test

5. Energy

Q1

Complete each sentence with the correct word.

(1) The ability to do work is called _____.

(2) The type of energy used to make food warm is _____.

(3) Animals use _____ to communicate with each other.

(4) We can use _____ to run electric appliances.

(5) _____ is energy that we can see.

Q2

Choose the letter with the correct answer.

(1) What type of energy lights up a light bulb?

A. Electricity

B. Heat

C. Sun

D. Sound

(2) Which list contains only types of energy?

A. electricity, heat, colour, sound

B. sound, heat, smell, electricity

C. heat, light, sound, electricity

D. light, heat, electricity, thought

(3) Which is <u>not</u> an example of sound energy being produced?

A. Knocking on the door

B. Wind blowing on the trees

C. A candle burning

D. A car engine roaring

(4) What kind of energy is produced when a candle is lit?

A. heat and sound

B. sound and electricity

C. electricity and heat

D. heat and light

Q3

(1) Identify types of energy that the sun provides to us.

_____

(2) Write two examples of how to get electricity in our daily life.

(i)_____

(ii)_____

(3) Explain two ways we can get heat energy.

(i) _____

(ii) _____

Q4

(1) What would happen if there was no light energy in the world?

_____

_____

(2) The picture shows a storm. What types of energy are produced during a thunder storm? Write your answer with a reason.

_____

_____

_____

_____

Chapter 6

The Sun

6.1 Properties of the Sun

Lesson 1: "The Sun in the Sky"

When we look at the sky in the daytime, we find the Sun in the sky. But what is the Sun? Do you know the Sun?

What is the Sun?

Activity : What do you know about the Sun?

What to Do:

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

What do you know about the Sun?	What if there is no Sun?

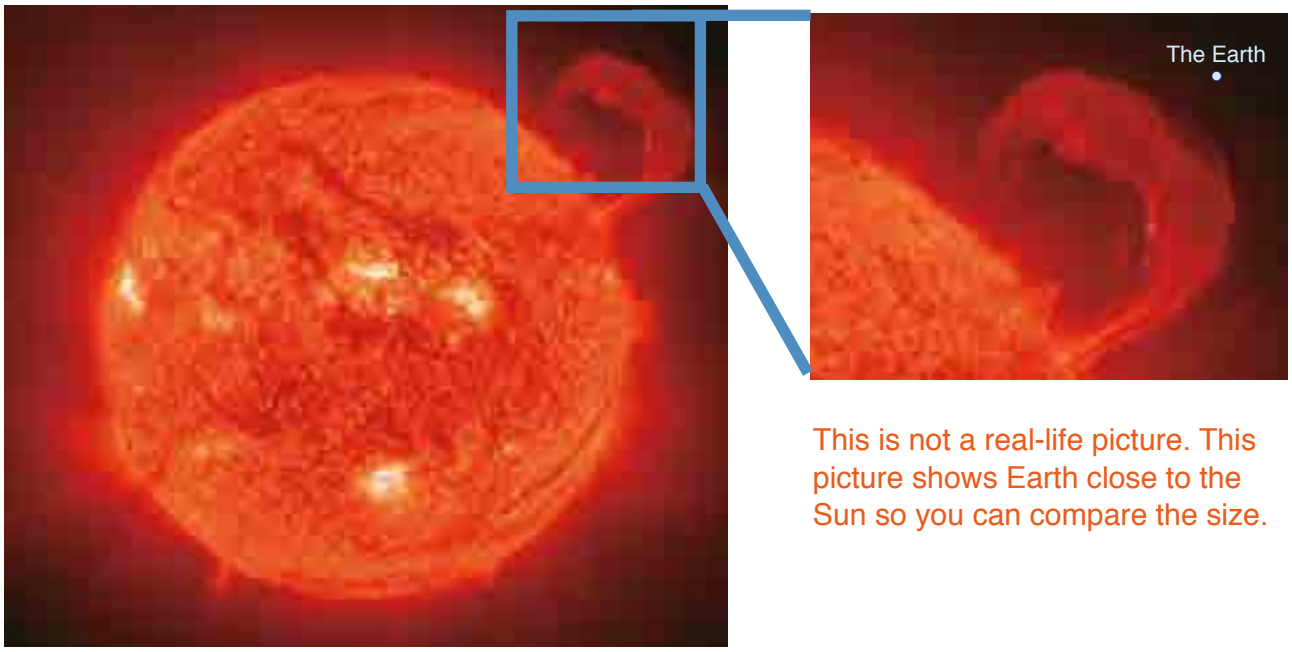
2. Think about the following questions and write your ideas in the table.
   - What do you know about the Sun?
   - If it were not for the Sun, what would happen to our Earth?

3. Share your ideas with your classmates. Talk about what you know about the Sun and how the Sun helps our earth.



Summary

The Sun is the brightest object in the sky during the day. The Sun is much larger than the Earth. It looks small because it is very far away from the Earth.



This is not a real-life picture. This picture shows Earth close to the Sun so you can compare the size.

The Sun is a big burning ball of hot gases that gives off energy. The Sun's energy reaches the Earth as light and heat. Heat from the Sun warms the land, water and air on the Earth. The Sun keeps people and animals warm. Light from the Sun helps people and animals see objects on the Earth. It also helps plants to grow and survive. Without the Sun, the Earth would be frozen and no living thing would be able to survive.

The Sun warms the animals.

Without the Sun, the Earth would be frozen.

Lesson 2: "Sunny Place and Shady Place"

Let's go outside. We can find a sunny place and a shady place.

How is a sunny place and a shady place different?

Activity : Measuring the temperature of the ground

What We Need:

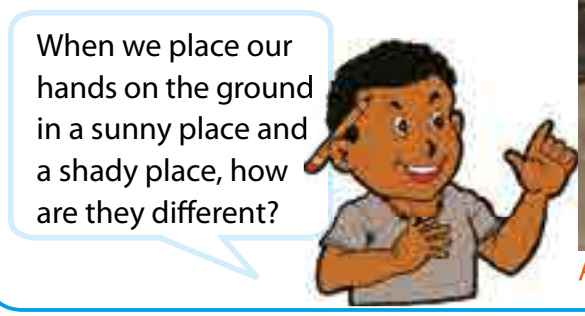
- Thermometer, A4 paper

What to Do:

1. Make a table like the one shown below.

Place	Temperature of Ground (Your Prediction)	Temperature you measured
Sunny place	°C	°C
Shady place	°C	°C

2. Guess the temperature of the ground in a sunny and a shady place and write your prediction in the table.
3. Place the bulb of the thermometer into the ground in a sunny and a shady place. After 10 minutes, measure the temperature of the ground in both places. Record your measurements in the table.
4. Share your ideas with your classmates. Talk about how the temperatures of the ground are different between a sunny and a shady place.




A sunny place


A shady place

Result

The temperature of the ground in a sunny place is higher than that of a shady place.

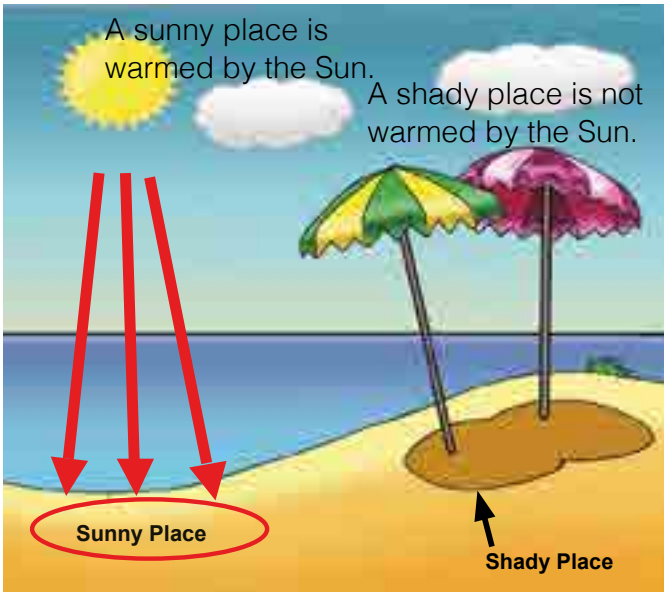
Place	Temperature you measured
A sunny place	25°C
A shady place	17°C

Example of the ground temperature result

Summary

Temperature is how warm or cool something is. A thermometer is used to measure the temperature. Temperature is measured in **degrees Celsius** [**°C**].

The temperatures of the ground are different between the sunny place and the shady place. The temperature of the ground in a sunny place is higher than that in a shady place because the ground of the sunny place is warmed by sunlight.



For example, we feel warm or dry when we place our hands on the ground of a sunny place. But we feel cool and damp when we place our hands on the ground in a shady place.

Comparing a sunny and a shady place

Summary and Exercise

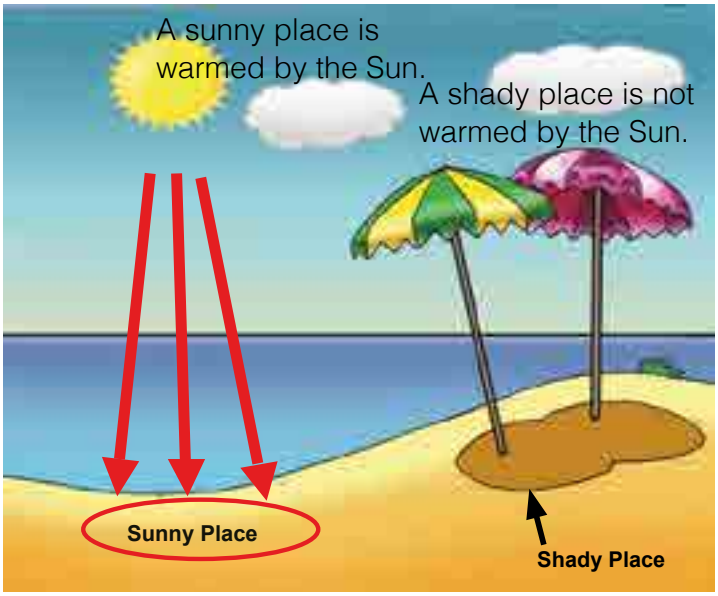
Summary 6.1 Properties of the Sun

The Sun in the Sky

- The Sun is the brightest object in the sky during the day. The Sun is much larger than the Earth but looks smaller because it is very far away from us.
- The Sun gives off energy in the form of heat and light. The Sun is the major source of energy.

Sunny and Shady places

- Temperature is how warm or cool something is.
- A thermometer is used to measure temperature.
- Temperature is measured in degrees Celsius [°C].
- The temperature of the ground in a sunny place is higher than that of a shady place because the ground of the sunny place is warmed by sunlight.



Summary and Exercise

Exercise 6.1 Properties of the Sun

Q1. Complete each sentence with the correct word.

(1) The_____ is the brightest object in the sky during the day.

(2) The Sun is a burning ball of hot gases that gives off _____.

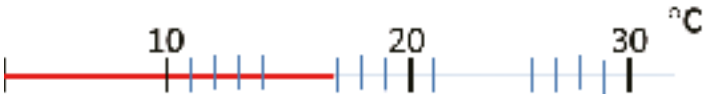
(3) The Sun's energy reaches the Earth as light and _____.

(4) _____ from the Sun helps people and animals to see.

(5) Plants use light from the Sun to make _____ and grow.

Q2. Choose the letter with the correct answer.

(1) What is the temperature reading shown on the thermometer below?



A. 18°C B. 20°C C. 17°C D. 19°C

(2) Why is the temperature of the sunny place higher than the shady place?

A. The sunny place is not warmed by sunlight

B. The sunny place is warmed by sunlight

C. The shady place is warmed by sunlight

D. Both the sunny and shady places are warmed by sunlight

Q3. Answer the following questions.

(1) The Sun is much larger than the earth. Why does the Sun looks smaller?

(2) How do living things use the sun's energy?

Q4. If there is no Sun what will happen to living things on Earth? Share your ideas and reasons.

6.2 Movement of the Sun

Lesson 1: "Sun and Shadow"

When we play outside in the sun, we can find shadows on the ground. Where can we find the shadow? How is a shadow made by the Sun?

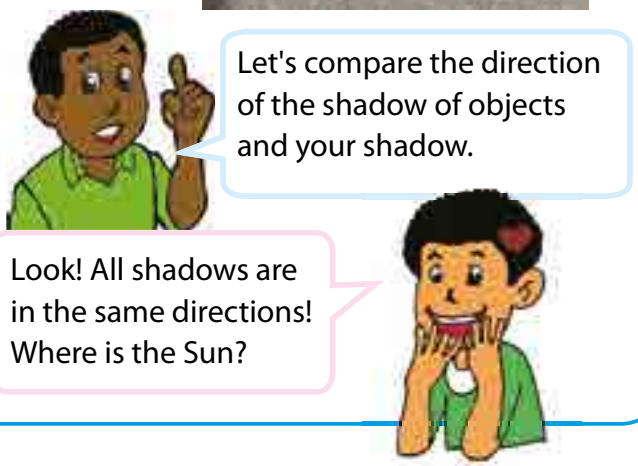
What is the relationship between the Sun and a shadow?

Activity : Observing sun and shadow

What to Do:

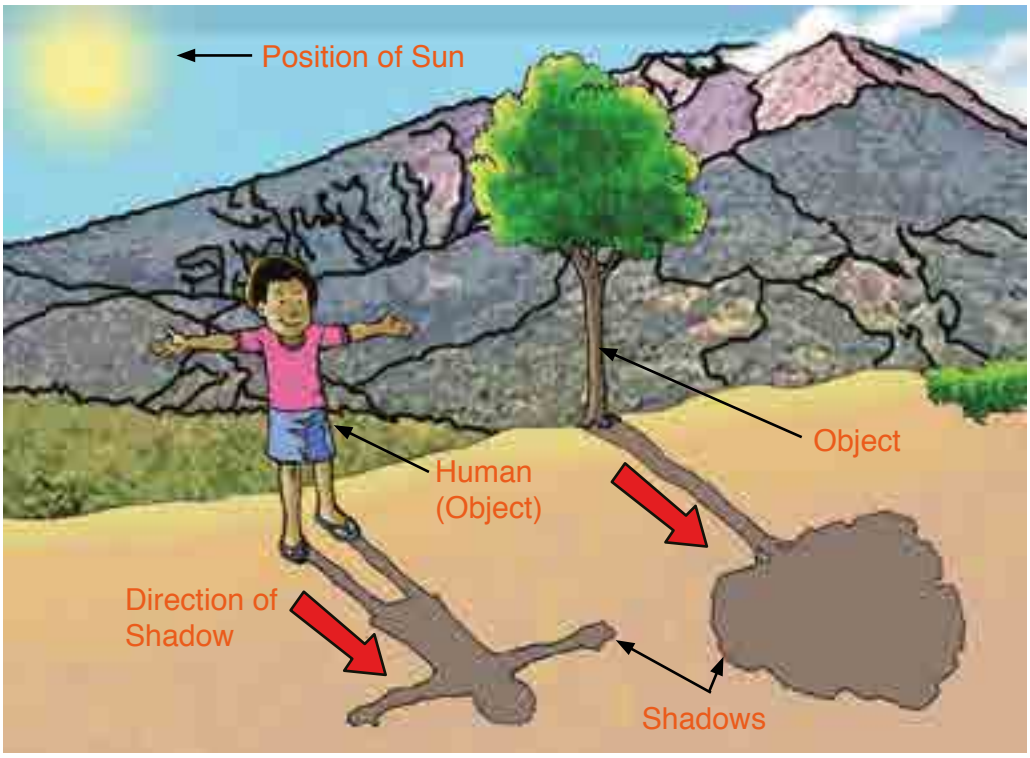
Do not look directly at the Sun!

1. Find a shadow in the school yard.
2. Observe the direction of the shadow and the position of the Sun. Record your observation in your exercise book.
3. Repeat steps 1 and 2 several times.
4. Share your ideas with your classmates. Talk about the relationship between the direction of the shadow and the position of the Sun.



Summary

When a shadow is made, the position of the Sun is opposite to the direction of the shadow. If light from the Sun is blocked by objects, the shadows are made in the same direction with light of the sun.



Discussion

Let's discuss the following question:

- 'Look at the pictures below. The direction of the shadow changes. Why does the direction of the shadow change?'

Lesson 2: "Movement of the Sun"

The Sun rises in the morning and sets in the evening every day.

How does the Sun move in the sky?

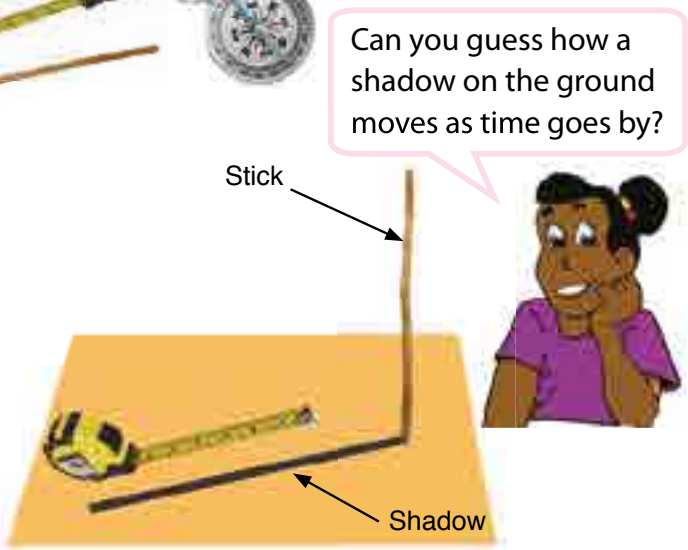
Activity : Observing the movement of shadow

What We Need:

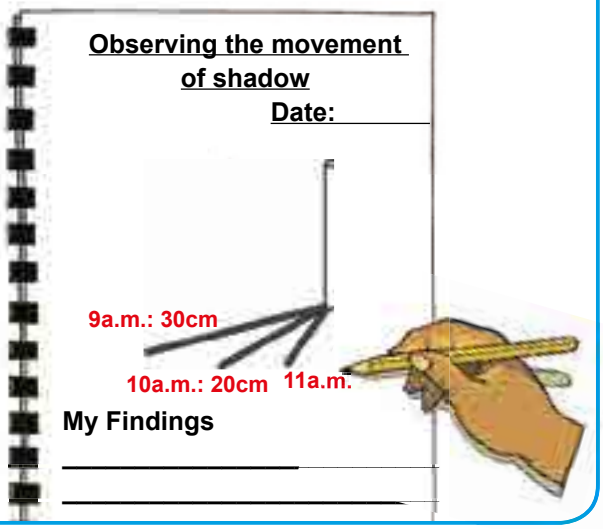
- a stick, compass, tape measure

What to Do:

1. Go out of the classroom and set up a stick on the ground.
2. Check the east and west directions with a compass.
3. Observe the shadow of the stick on the ground and draw a sketch of the shadow in your exercise book.
4. Measure the length of the shadow with a tape measure. Record the length and the time you observe in your exercise book.
5. Repeat steps 3 and 4 every hour during the day.



Do not look directly at the Sun!



Discussion

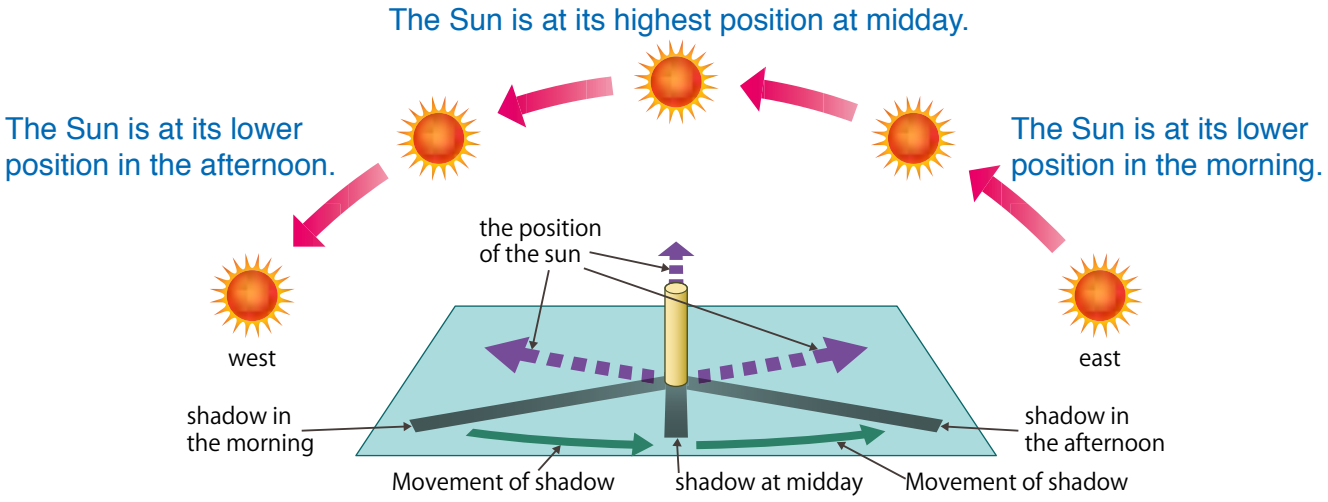
Let's discuss the following questions:

- How has the length of the shadow changed?
- How has the shadow moved? Why?
- How has the Sun moved?

Do you remember the relationship between the position of the Sun and the direction of the shadow?

Summary

A shadow changes its length and direction as the Sun moves across the sky. In the morning and in the evening, shadows are longer and the Sun is lower in the sky. At midday, the length of the shadow is shortest and the Sun is at its highest position in the sky.
Shadows move from west to east depending on the time of the day. This is because the Sun rises in the east, moves across the sky and sets in the west.



People developed the device to tell time by observing the Sun and shadows.

This device is called "Sun Clock". A sun clock uses a shadow's position to tell the time.

Lesson 3: "Day and Night"

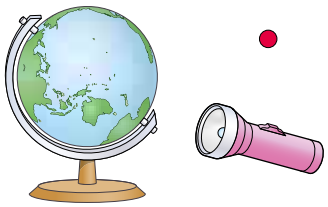
We get up in the morning. We are active during the day and sleep at night.

What causes day and night?

Activity : Which part is day or night?

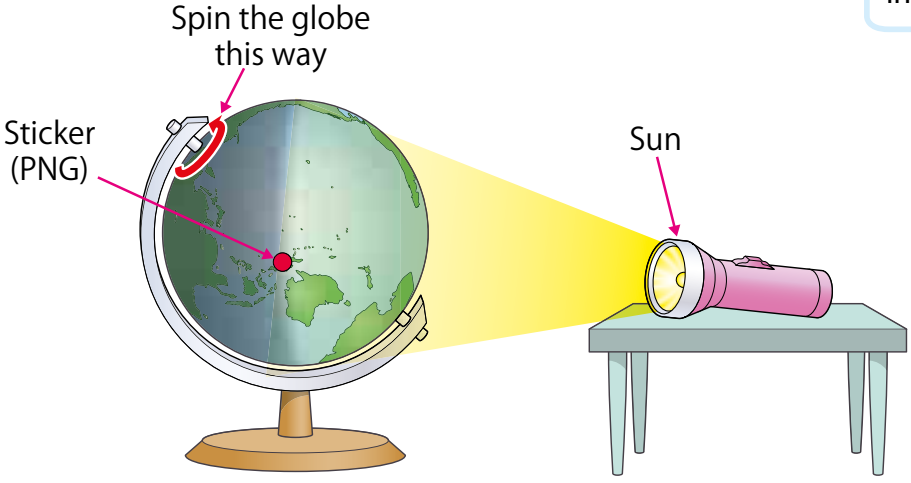
What We Need:

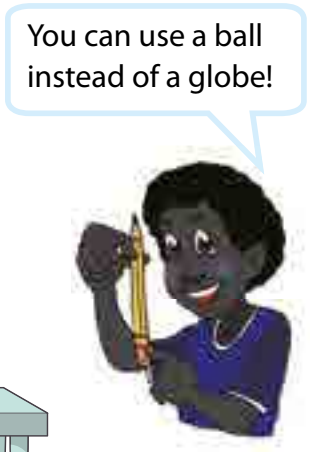
- globe, sticker, flashlight



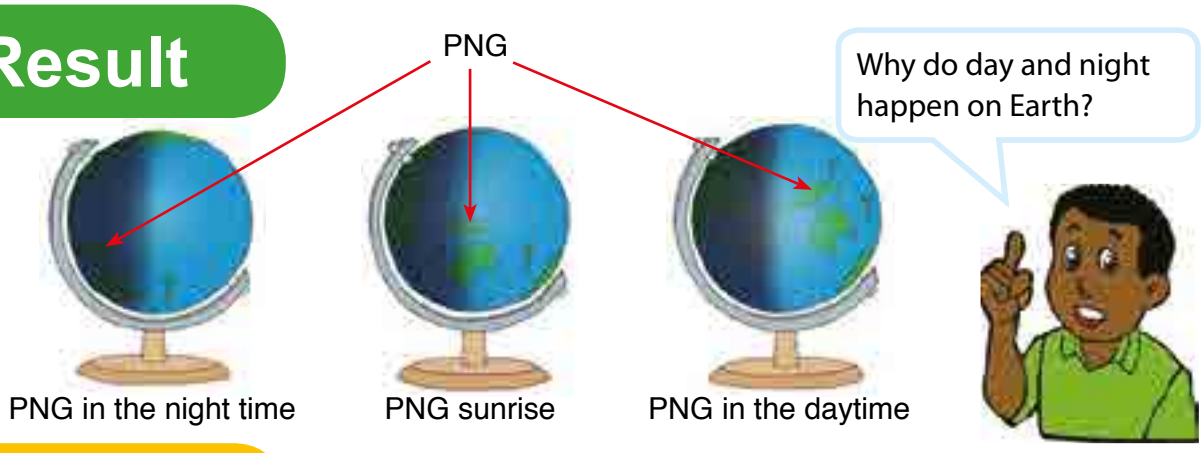
What to Do:

1. Put a sticker on where Papua New Guinea (PNG) is on the globe.
2. Make the classroom dark and shine the flashlight on the globe.
3. By spinning the globe anticlockwise slowly as shown below. Try to place PNG in the position of "Day", "Night", "Sunrise" and "Sunset".
4. Share your ideas with your classmates. Talk about which part of the globe is day or night.



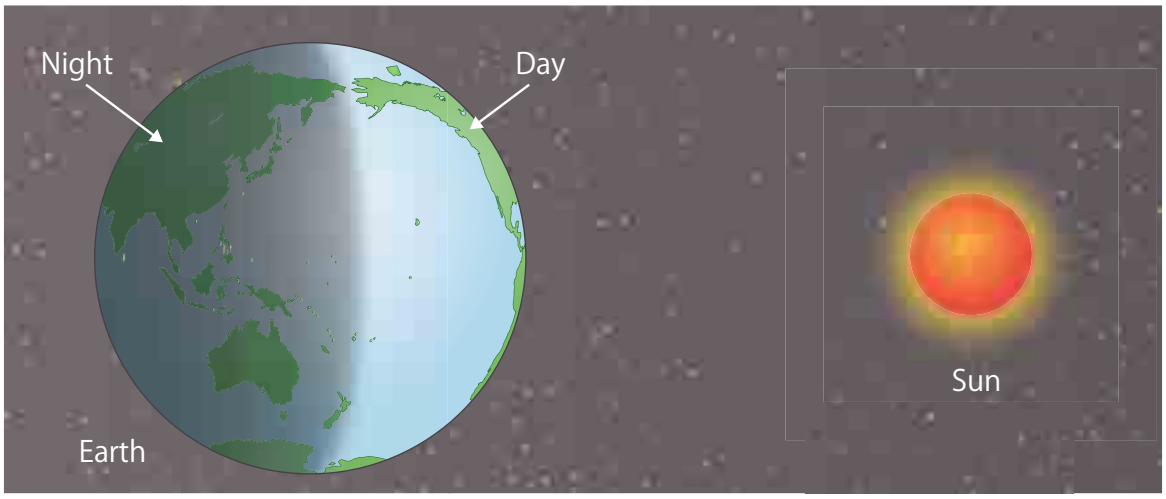


Result



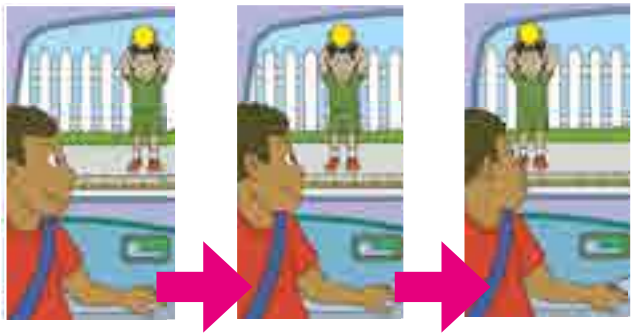
Summary

Day and night occur because the Earth is spinning on its axis once every 24 hours. An **axis** is an imaginary line that runs through the Earth centre from the north to the south poles. The part of the Earth that is facing the Sun is day. The part of the Earth that is facing away from the Sun is night.



Day and Night on the Earth

The Sun actually does not move around the Earth. Why does the Sun seem to move across the sky? This is because the Earth is spinning on its axis. For example, a girl standing outside seems to move when we see the girl from the moving car. The Sun also seems to move when we see the Sun from the spinning Earth.



A girl seems to move across the window when a boy in a moving bus sees the girl.

Summary and Exercise

Summary 6.2 Movement of the Sun

Sun and Shadow

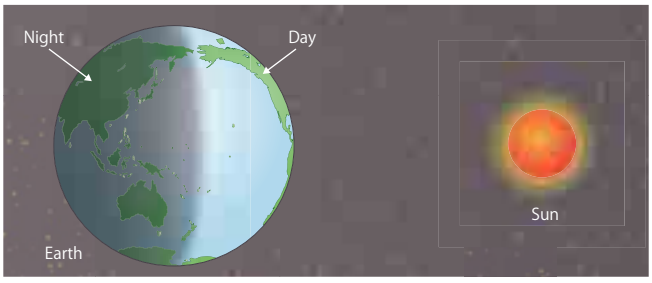
- When a shadow is made, the position of the Sun is opposite to the direction of the shadow.
- The change in the position of the Sun causes the direction of the shadows to change.

Movement of the Sun

- A shadow changes its length and position as the Sun moves across the sky.
- Shadows are long in the morning and afternoon because the Sun is at a lower position in the sky.
- At midday the shadows are shortest because the Sun is at its highest position in the sky.
- The Sun rises in the east and sets in the west. The shadow of an object moves from west to east.

Day and Night

- The part of the Earth that is facing the sun is the day.
- The part of the Earth that is facing away from the sun is the night.
- The Earth rotates or spins on its axis once every 24 hours, causing day and night on earth.
- The Sun actually does not move around Earth.The Sun seems to move when we see the Sun from the spinning Earth.



Summary and Exercise

Exercise 6.2 Movement of the Sun

Q1. Complete each sentence with the correct word.

(1) The change in the position of the Sun causes the direction of the _____ to change.

(2) Shadows are long in the morning and afternoon because the Sun is_____ in the sky.

(3) The Sun rises in the_____and sets in the west.

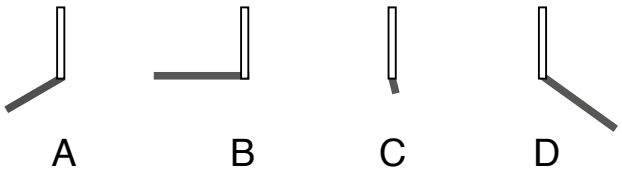
(4) The shadows move from west to _____.

(5) The part of the earth facing away from the Sun is _____.

Q2. Choose the letter with the correct answer.

(1) William conducted an experiment with sticks. The pictures below were drawn from his observations of the Sun's movement across the sky.

Which picture shows the time of the day when the Sun was highest in the sky?



A B C D

(2) How many hours does it take for the earth to spin on its axis?

A. 12 hours

B. 24 hours

C. 26 hours

D. 48 hours

Q3. Answer the following questions.

(1) What causes the shadow during a sunny day to change?

(2) Where does the shadow from an object that blocks the sunlight appear?

Q4. What causes day and night to happen on earth?

Where are the stars during the day?

Can we find stars in the sky during the day?
Do the stars escape from the sky during the day?
In fact, stars are always in the sky. During the day the Sun makes the sky too bright to see other stars. Therefore we cannot see them. After the Sun sets, the Sun does not shine in the sky and darkness comes in. We can see the light from other stars during the night.

Chapter Test

6. The Sun

Q1

Complete each sentence with the correct word.

(1) The ground of a sunny place is warmed by the _____.

(2) The measure of how warm or cool something is, is called _____.

(3) A _____ is used to measure temperature.

(4) The Sun rises in the _____ and sets in the _____.

Q2

Choose the letter with the correct answer.

(1) What makes the day sky bright?

A. The moon

B. The stars

C. The sun

D. The planets

(2) Which of the following is the correct explanation about the shadow of an object on a sunny day.

A. Direction of the shadow is opposite to the position of the Sun.

B. Direction of the shadow is always west.

C. Direction of the shadow is same to the position of the Sun.

D. Direction of the shadow never moves.

(3) The pattern of day and night is caused by Earth's _____ on its axis.

A. earthquake

B. gravity

C. revolution

D. spin

(4) Temperature is measured in _____.

A. centimeters

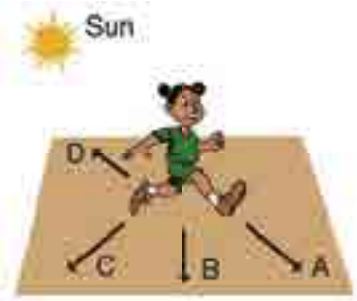
B. millimeters

C. grams

D. degree Celsius

Q3

(1) Look at the picture on the right. Suggest which direction the shadow of the girl would appear? Choose a letter and write your reason?



_____

_____

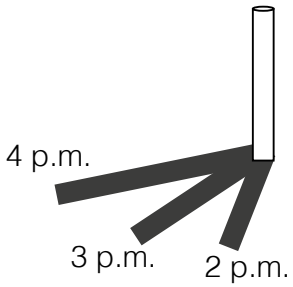
_____

(2) What is the temperature reading shown on the thermometer?

_____

Q4

(1) Dave observed the direction of the shadow beside a pole at 2p.m., 3p.m. and 4p.m. The drawing of the shadows are shown in the diagram on the right. What is the reason why the direction of the shadow moves as time goes by?



_____

_____

(2) When you watch the Sun setting, what is happening on the other side of the Earth ? Explain your reason.

_____

_____

_____

Chapter 7

Light

7.1 Properties of Light

Lesson 1: "What makes us See Objects?"

During the day we can see objects around us. At night we cannot see objects. Why can we see objects during the day?

Why can we see objects during the day but not at night?

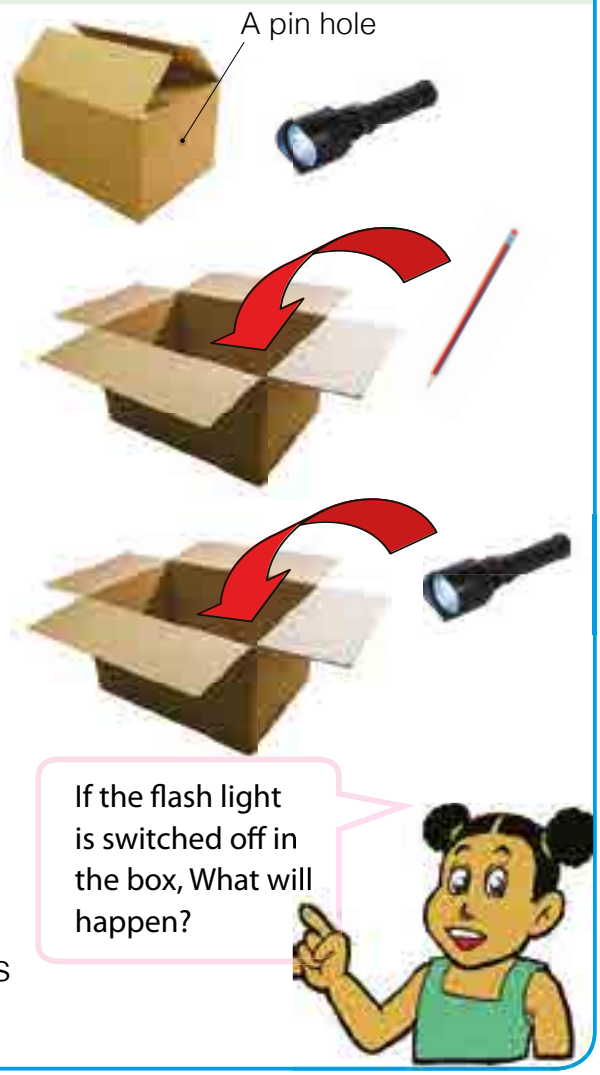
Activity : What is in the box?

What We Need:

- cardboard box with a pin hole, flashlight, any object

What to Do:

1. Place an object in the cardboard box and close the box firmly.
2. Peep through the hole in the box and record what you observe in your exercise book.
3. Switch on a flashlight and place it next to the object in the box. Close the box firmly.
4. Peep through the hole in the box again and record what you observe in your exercise book.
5. Share your ideas with your classmates. Talk about what helps you see the object in the box.



Summary

Light is an energy that we can see. Light helps us to see objects around us. Without light, we cannot see anything around us.

We cannot see anything without light.

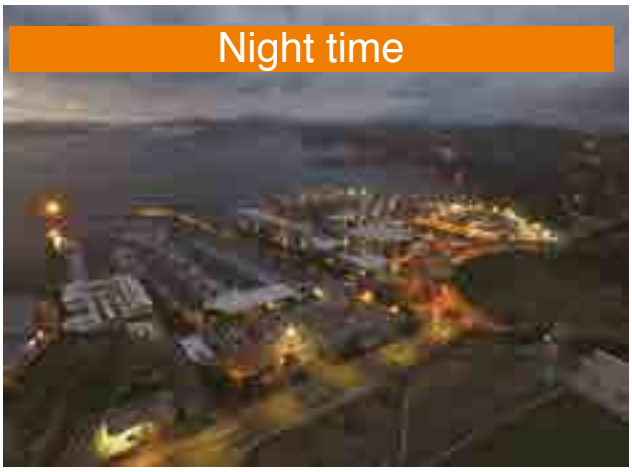
We can see things with light.

Some objects give off light. Objects that give off light are called **sources of light**. The sun is our major source of light. Candles, fire, torches and lamps are also sources of light. People, water and rocks are not sources of light because they do not give off light.

Different sources of light

During the day, the sun makes our environment bright and allows us to see objects. At night, there is no light from the sun. We need light to see objects. Fire and lamps help us see objects at night.

The sun helps us see objects.



Light from lamps help us see objects.

Lesson 2: "How Does Light Travel?"

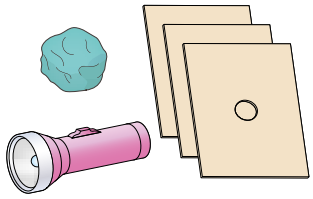
Light helps us to see objects. Without light we cannot see anything around us. But, what path does light take when it travels?

How does light travel?

Activity : Light Travelling

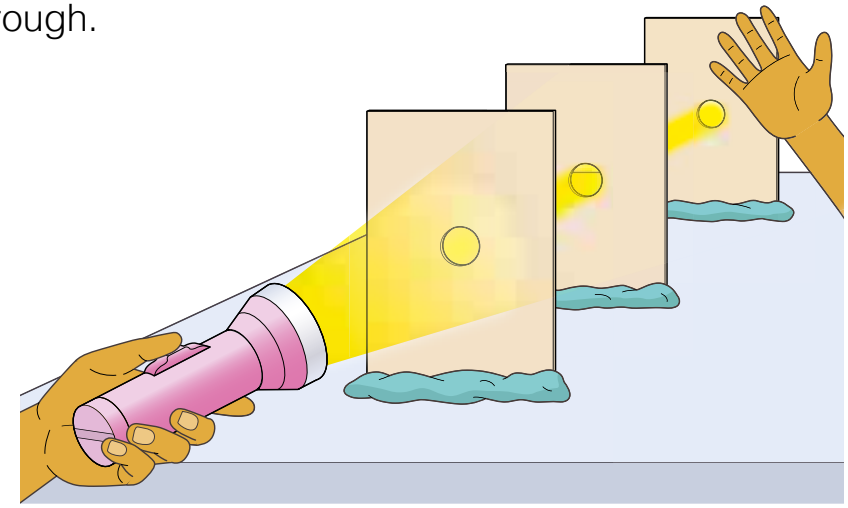
What We Need:

- clay, flashlight, three pieces of cardboard with a hole each.



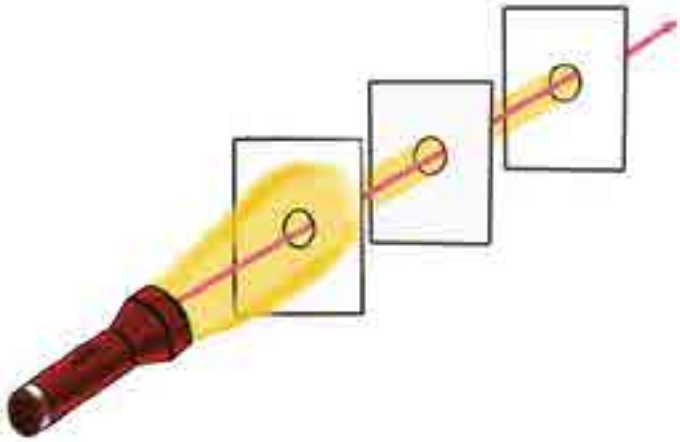
What to Do:

1. Place three cardboards on a table as shown in the figure below.
2. Place the flashlight at one end of the row of cardboards and switch on the flashlight. Adjust the cardboards so that you can see the light from the flashlight through all the holes.
3. Observe how the light can be seen through all holes and record your observation.
4. Next, place a hand between two cardboards and observe what happens to the light. Record your observations.
5. Share your findings with your classmates. Talk about what path light travels through.

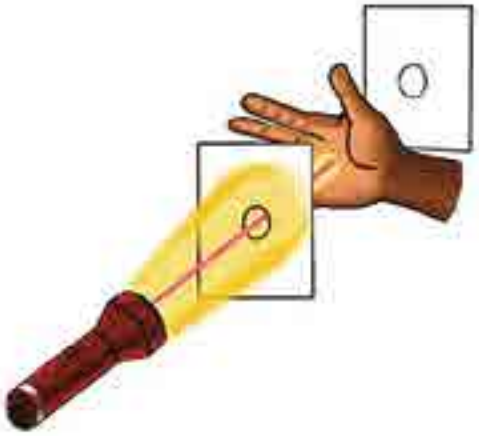


Summary

When all the holes in the cardboards are arranged in a straight line, light can be seen through the holes. But the light stops and cannot travel through all holes when the holes are not arranged in a straight line. This means that light travels in a straight line. When we place a hand in the path of light, the light is blocked and cannot pass through the hand.

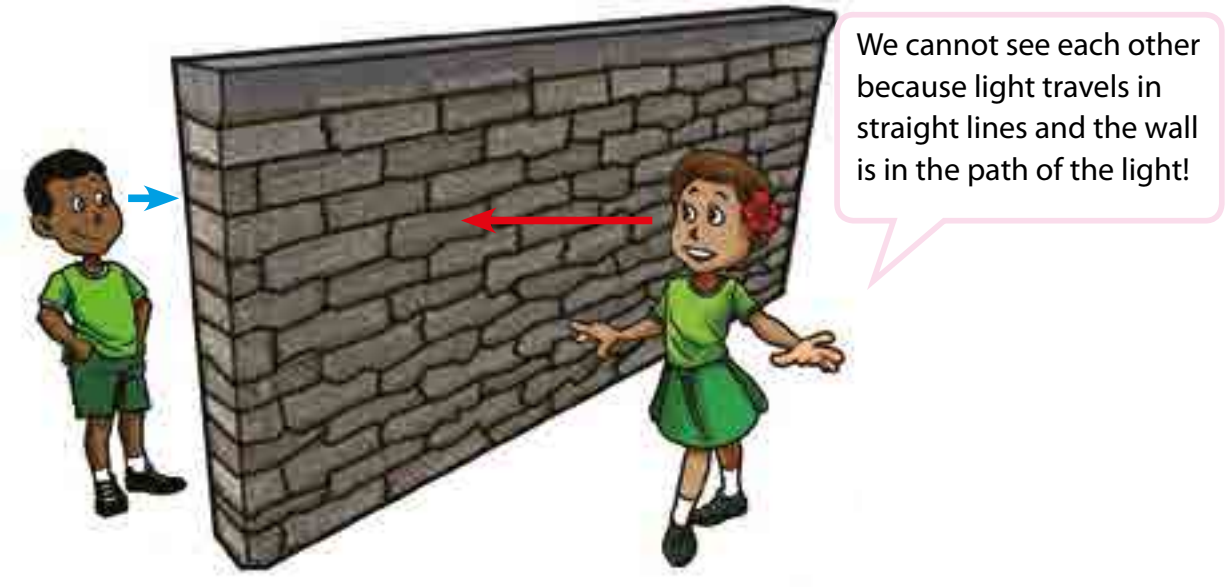


Light can travel through all the holes when the holes are in a straight line.



When a hand is placed in the path of the light, the light cannot pass through it.

We cannot see objects hidden behind another object because light travels in a straight line and it cannot pass through the object.



Lesson 3: "Light Passing Through Objects"

Light travels in a straight line. That's why we cannot see objects behind a concrete wall. But, we can see objects through a glass window.

Why can we see through a glass window but not a concrete wall?

Activity : Can light pass through?

What We Need:

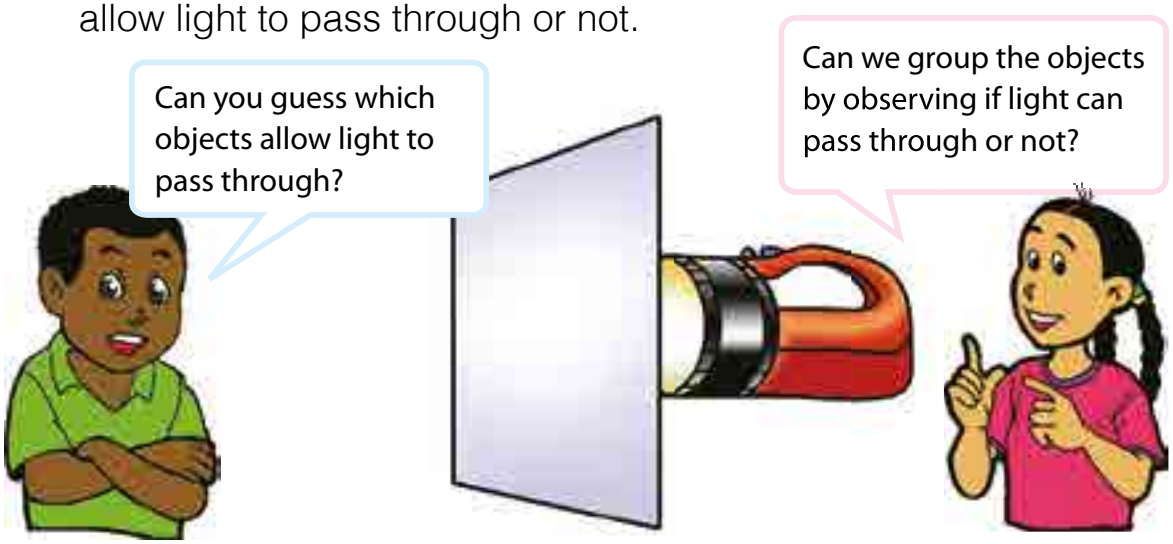
- water, glass cup, tissue paper, plastic bag, stone, book, other objects you want to check, flashlight

What to Do:

1. Make a table like the one shown below.

Objects that light can pass through	Objects that some light can pass through	Objects that light cannot pass through

2. Switch on a flashlight and place each object in front of it.
3. Observe whether or not light passes through the object and write your observation in the table.
4. Share your ideas with your classmates. Talk about which objects allow light to pass through or not.



Summary

Objects vary in how they allow light to pass through.

Transparent Objects

Transparent objects allow light to travel through them. We can see clearly through them. Air, water and clear glass are transparent objects. When light strikes on the transparent objects, almost all of it passes directly through them.

Translucent Objects

Translucent objects allow some light to travel through them. We cannot see clearly through them. Frosted glass and some plastics are translucent objects. When light strikes on the translucent objects, only some of the light passes through them.

Opaque Objects

Opaque objects do not let any light to travel through them. We cannot see through them. Wood, stone, concrete and books are opaque objects.

Translucent glass

Lesson 4: "Formation of Shadow"

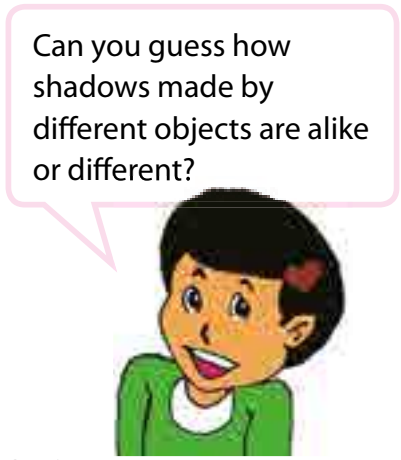
There are three kinds of objects; transparent, translucent and opaque. How are shadows made when light is blocked by these objects? Are all shadows alike or different?

How is a shadow made?

Activity : Shadows made by different objects

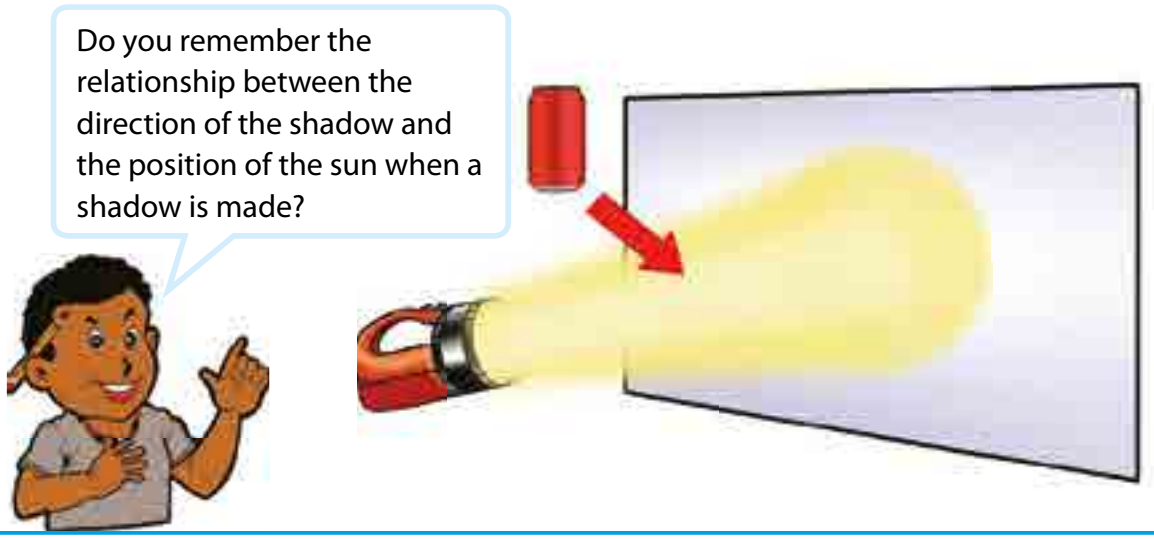
What We Need:

- transparent objects, translucent objects, opaque objects, flashlight



What to Do:

1. Switch on the flashlight and place it in front of a wall.
2. Place the transparent object between the flashlight and the wall. Observe how the shadow of the object is made and record your observation in your exercise book.
3. Repeat step 2 using a translucent and an opaque object.
4. Share and talk about how a shadow is formed using a transparent, translucent and an opaque object.



Result

Opaque and translucent objects make shadows. But transparent objects cannot make shadows.

Examples of Results

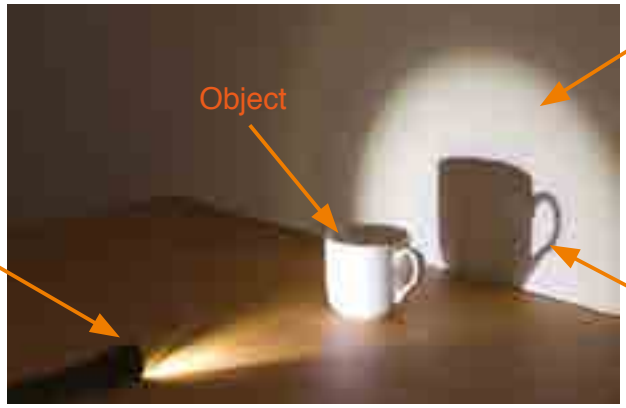
An opaque object

A translucent object

A transparent object

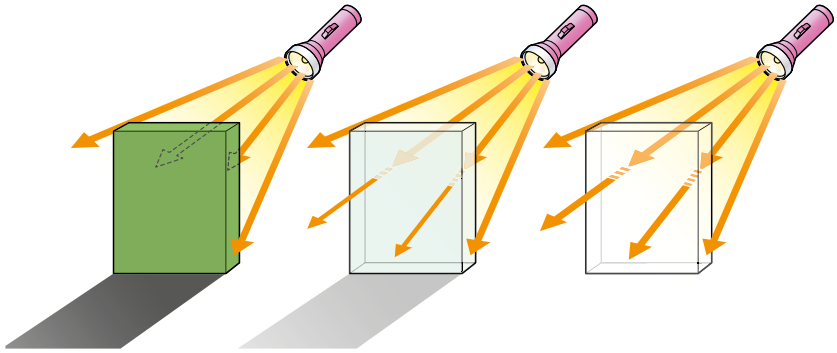
Summary

A shadow is made when light is blocked by objects. A source of light, an object and a screen such as a wall and the ground are necessary for a shadow to form.



Both opaque and translucent objects make shadows. Opaque objects make clear dark shadows because they cannot allow light to pass through them. Translucent objects make faint shadows as light is able to pass partially through them. Transparent objects cannot make any shadow as they let light pass straight through them.

Shadow of objects



An opaque object A translucent object A transparent object

Lesson 5: "Shape and Size of Shadow"

When we observe a shadow on the ground during the day its shape and size changes. The shape and size of a shadow is not always the same.

How can we change the shape and size of a shadow?

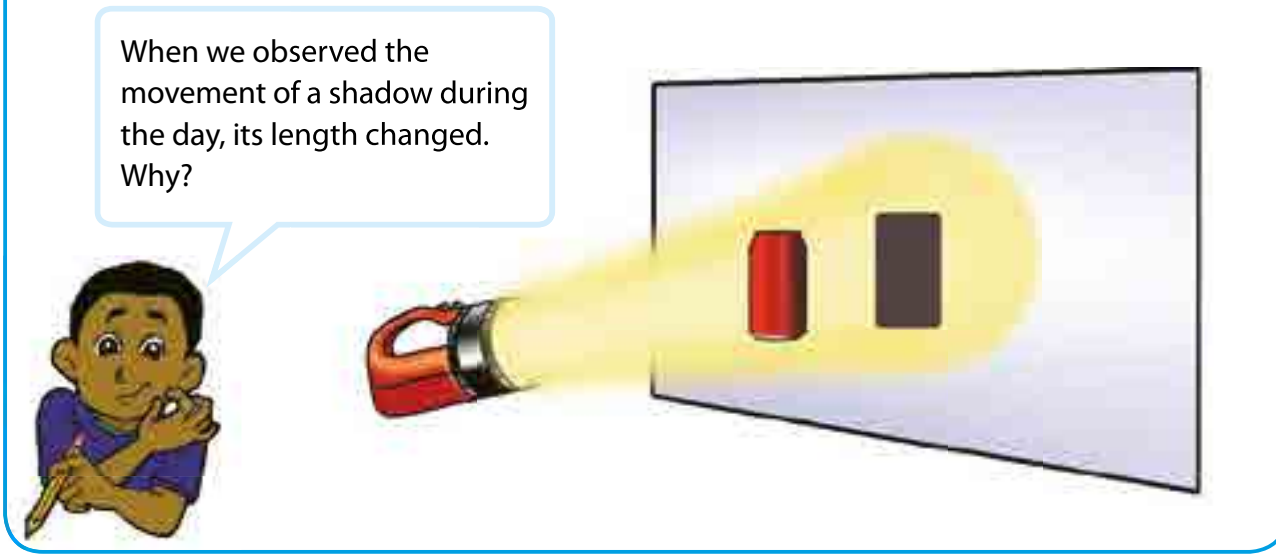
Activity : Changing the shape and size of a shadow

What We Need:

- tin can, flashlight

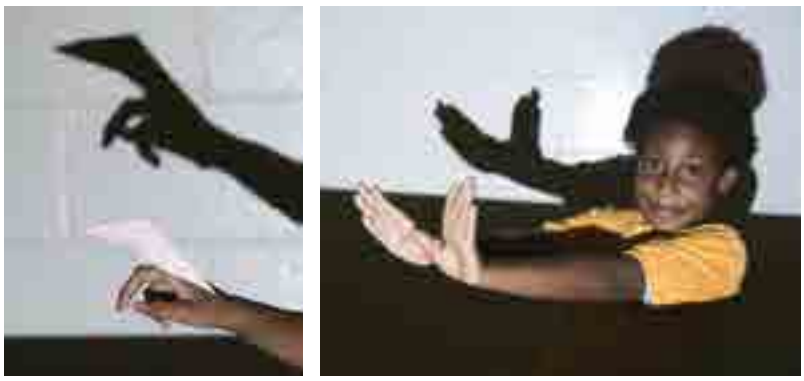
What to Do:

1. Think of how you can change the shape and size of a shadow.
2. Switch on the flashlight and place it in front of a wall.
3. Try to change the shape and size of a tin can's shadow based on your ideas.
4. Record how you changed the shape and size of the shadow in your exercise book.
5. Share your ideas with your classmates. Talk about how you can change the shape and size of the shadow.



Summary

We can change the shape and size of a shadow by moving the source of light or the object.



The shadow of an object has the same shape as the object.

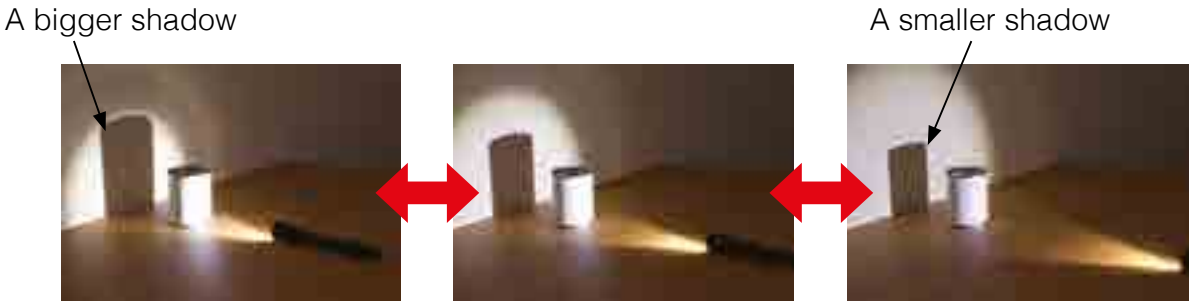
Shape of Shadow

A shadow of an object usually has the same shape as the object. An object can make shadows of different shapes if we move or turn the object, as the light is shining at different parts of the object.

We can change the shape of the shadow by turning the object.

Size of Shadow

We can change the size of a shadow if we change the distance between the object and the source of light. The size of the shadow becomes bigger if the object is moved closer to the source of light or the source of light is moved closer to the object. The size of a shadow becomes smaller if the object is moved further from the source of light or the source of light is moved further from the object.



A flashlight closer to a can

Starting position of the flashlight

A flashlight further form a can

Lesson 6: "Light Reflection"

We can see a source of light because it gives off light. Some objects cannot give off light, but we can see the objects.

Why can we see the objects around us?

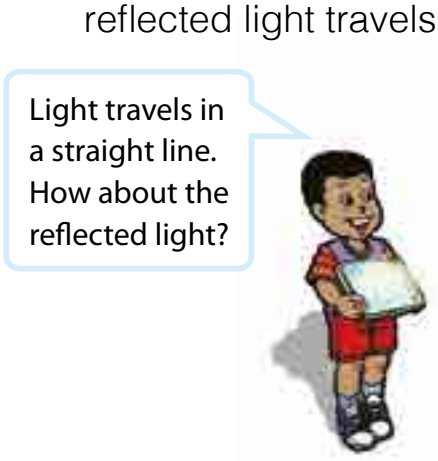
Activity : Light reflected by Mirror

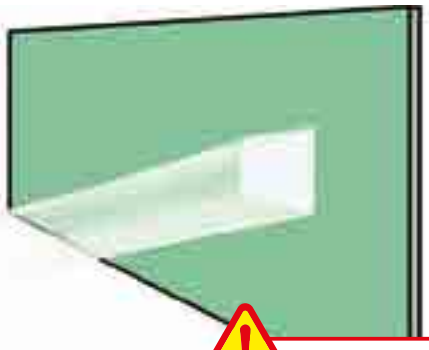
What We Need:

- mirror

What to Do:

1. Think about what will happen to the light after it is reflected off a mirror.
2. Go out of the classroom with a mirror.
3. Reflect the sunlight using the mirror and aim it at the wall.
4. Decide targets on the wall and shine the reflected light on the targets by moving the mirror.
5. Observe how the reflected light travels and record your observation in your exercise book.
6. Share your ideas with your classmates. Talk about how the reflected light travels.

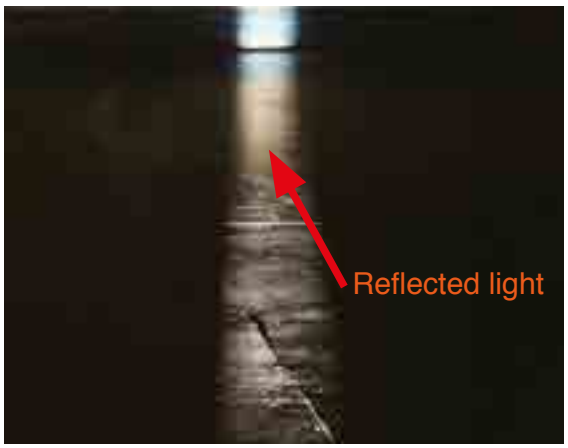




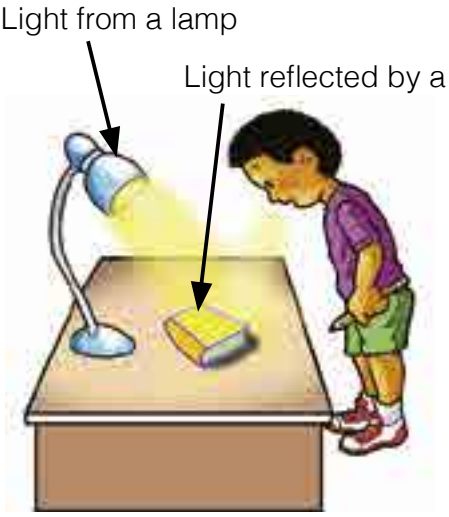
Do not aim the reflected light at your friends' faces.!

Summary

Light travels in a straight line. When the light from the sun hits the surface of a mirror, the light will be reflected by the mirror. The reflected light also travels in a straight line. **Reflection** is when light bounces off an object.



The reflected light also travels in straight lines.



We can see a book because the light reflected by the book enters our eyes.

Apart from mirrors, there are other objects that reflect light. For example, when the light hits the surface of a book, the light will be reflected by the book. The reflected light will travel in a straight line and enter our eyes. That is why we can see a book even though the book does not give off light. The surface of water, glass and metal also reflect light.

Lesson 7: "Gathering Light"

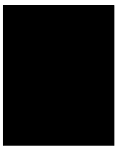
When light hits the surface of an object, it is reflected by the object. If we gather the light, what will happen?

What will happen if light is gathered?

Activity : Observing brightness and warmth of Light

What We Need:

- hand lens, black paper



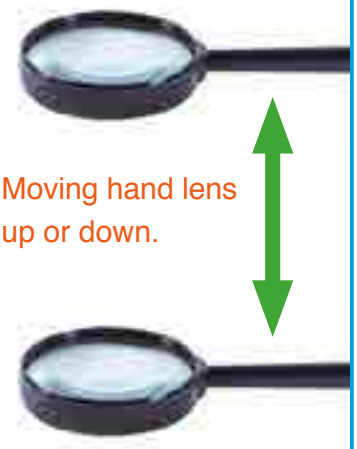
Do not look at the Sun through the lens.

What to Do:

1. Make a table like the one shown on the right.

Size of Light	Brightness	Change in Paper
Biggest		
Smallest		

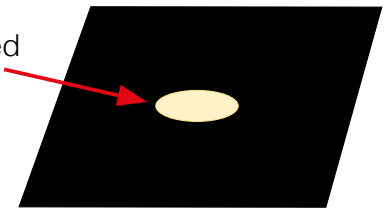
2. Gather the light from the sun on the paper with the hand lens.
3. Make the biggest size of the light on the paper by moving the hand lens up or down.
4. Observe the brightness of the light and see what happens to the paper. Record your observation in the table.
5. Make the smallest size of the light on the paper. Observe the brightness of the light and see what happens to the paper. Record your observation in the table.
6. Share your observation with your classmates. Talk about the relationship between the brightness and warmth of the light.



Moving hand lens up or down.

Do not place your hand between the lens and the paper.

The light gathered by a hand lens



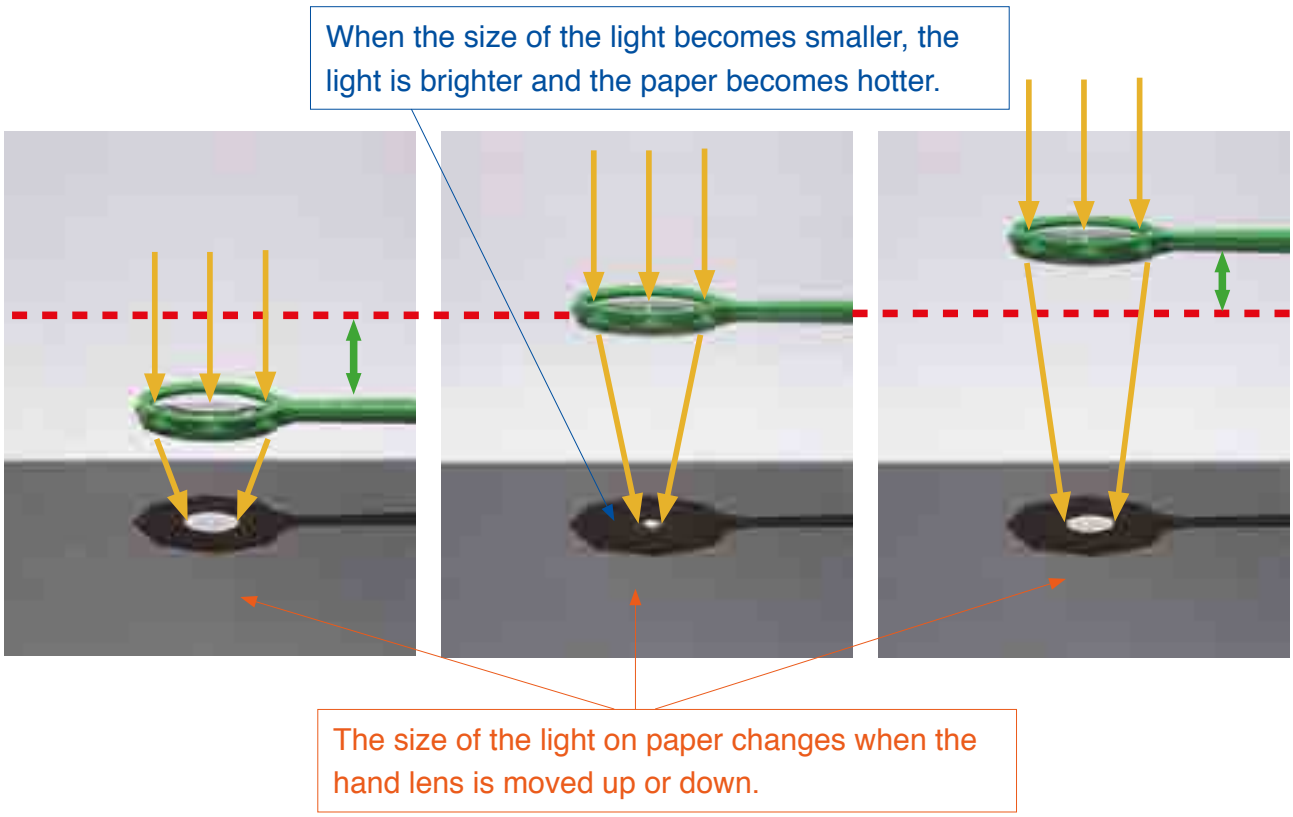
Result

Size of light	Brightness	Change in paper
Biggest	It is brighter.	It doesn't change.
Smallest	It is brightest.	Smoke goes up from paper then it burns.

When the size of the light is smaller, the light becomes brighter and smoke goes up from the paper.

Summary

We can gather light with a hand lens. The size of the light on the paper changes when we move the hand lens up or down. The smaller the size of light on the paper is, the brighter the light is and the hotter the paper becomes.



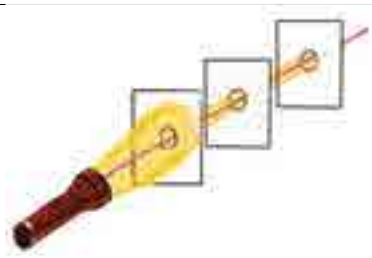
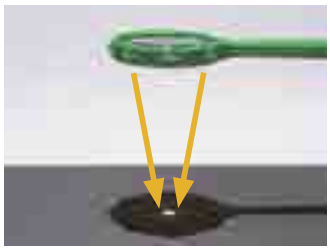
Summary and Exercise

Summary 7.1 Properties of Light

Light

- Light is a form of energy that helps us to see things.
- Light comes from a light source.

Properties of Light

		
Light travels in a straight line.	Light can be reflected by the surface of objects.	Light can be gathered using a lens.

Formation of Shadow

- A shadow is made when light is blocked by an object.
- Different objects allow different amounts of light to pass through.

		
Transparent objects allow light to travel through them.	Translucent objects allow some light to travel through them	Opaque objects do not allow light to pass through them.

- Size and shape of the shadow can be changed by moving the source of light or the object.

Summary and Exercise

Exercise 7.1 Properties of Light

Q1. Complete the sentence with the correct word.

(1) _____ enables us to see things around us.

(2) Light is a form of _____.

(3) A _____ is made when light is blocked by an object.

(4) _____ objects allow only some light to pass through.

(5) Light can be gathered using a _____.

Q2. Choose the letter with the correct answer.

(1) Which of the following has the correct explanation about light?

A) Light travels in a wavy line.

B) Light does not pass through opaque objects.

C) Light does not reflect off objects.

D) Light is energy that can be heard.

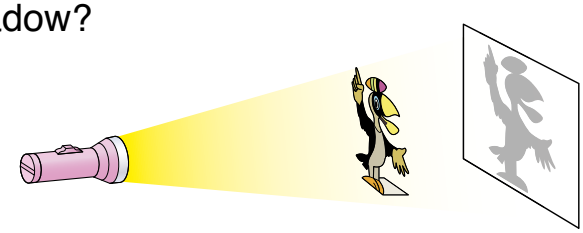
Q3. Answer the following questions.

(1) Which of the following are sources of light?

Sun Mirror Diamond Flashlight




(2) Look at the picture below. Can you name two ways to increase the size of the shadow?



Q4. A plant, book or dog do not make light for themselves but we are able to see them. Can you explain how we are able to see them?

What is a rainbow?

Rainbow in the sky

We sometimes can see the rainbow if the sun is shining and while the rain is falling or immediately after the rain stops.

A rainbow is a light that is caused by sun's light reflected and separated into different colours on a screen of many water droplets in the sky. The red ribbon of colour will always be on the outer edge of the rainbow. The blue will always be on the inside edge of the rainbow.

We can make a rainbow of our own. We will need; a sunny day and a garden hose with a fine mist nozzle. While standing in a sunny spot, point the hose in the direction of your shadow and turn it on. We can see a rainbow.

Chapter Test

7. Light

Q1

Complete each sentence with the correct word.

(1) An object that produces light is called _____ of light.

(2) The _____ provides both heat and light for the earth.

(3) A _____is formed when objects block the light path.

(4) _____ objects cannot allow light to pass through them.

Q2

Choose the letter with the correct answer.

(1) How does light travel?

A. Light travels in a straight line.

B. Light travels in a wavy line.

C. Light travels around corners.

D. Light travels in a zigzag line.

(2) Which one of the following objects allows light to pass through?

A. Mirror

B. Books

C. Blackboard

D. Water

(3) What happens to the light when it hits a flat mirror?

A. The light passes through the mirror.

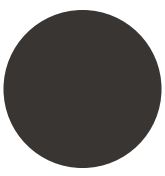
B. The light is reflected off the mirror.

C. The light gathers at one place.

D. The light disappears.

(4) Study the kettle shown on the right.

Which shadow will be possibly made if light is shone on the kettle?

A.	B.	C.	D.
			

Q3

(1) Write two examples of sources of light.

_____

(2) Write two examples of transparent and opaque objects.

Transparent objects: _____

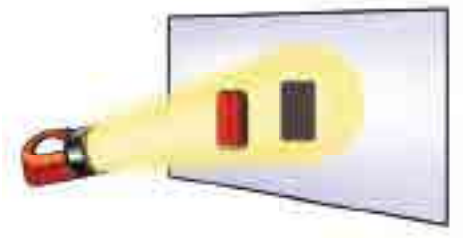
Opaque objects: _____

(3) State what hand lens can do with light?

_____

Q4

(1) Ketsin made a shadow of a can on a wall. Explain how he can change the shape of the shadow.



_____

_____

(2) A'alia tries to burn a piece of black paper using a hand lens on a sunny day. But the paper did not burn. Suggest your idea on how to improve her experiment to burn the paper using a hand lens.

_____

_____

_____

Chapter 8

Magnet

Why are the clips attracted to each other?

Can you guess the name of the object above the clips?

8.1 Properties of Magnet

Lesson 1: "Magnet around Us"

We can find magnets around us. But what are magnets? Let's investigate the wonders of magnets!

What is a magnet?

Activity : What can magnets do?

What We Need:

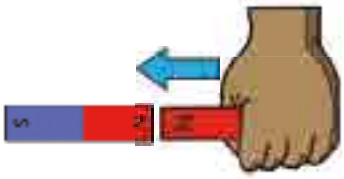
- two bar magnets, clips, thread, cardboard

What to Do:

1. Make a table like the one shown below.

What you observed

2. Think about what magnets can do. Try to find what magnets can do by using two magnets, clips and cardboard based on your ideas.
3. Record your observations in the table.
4. Share your ideas with your classmates. Talk about what magnets can do.



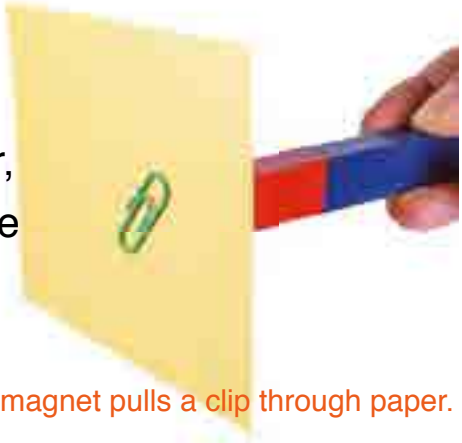
Summary

A **magnet** is an object. Some magnets are made of iron. There are different shapes and sizes of magnets. Some magnets are flat, straight, round and some are in the shape of a horseshoe.

All magnets can push or pull some objects. When a magnet is near nails or clips, the magnet pulls them. When two magnets are placed near each other, they push or pull each other.

A magnet pushes another magnet.

A magnet can also pull objects through paper, glass, plastic, water or air without touching the magnet. If paper comes between a magnet and an object, the magnet pulls the object.

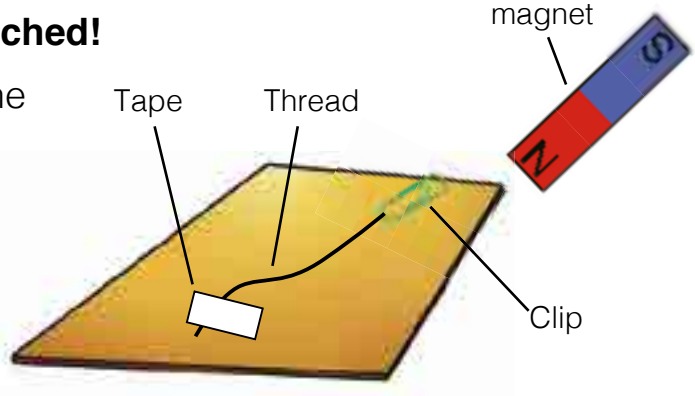


A magnet pulls a clip through paper.

Try it!

Let's lift a clip without being touched!

- Prepare a clip and thread like the picture shown on the right.
- Can you use a magnet to pull a clip without touching it?



Lesson 2: "What is Attracted to a Magnet?"

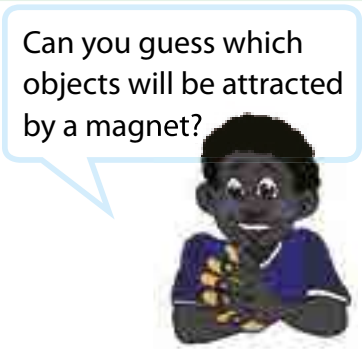
You observed that magnet can attract clips. But can it attract everything?

What things are attracted to a magnet?

Activity : Finding things attracted to a magnet

What We Need:

- magnet, coin, iron nail, clip, exercise book, steel can, aluminium can and objects you want to investigate



What to Do:

1. Make a table like the one shown below.

Objects	Prediction	Objects attracted or not attracted to magnet

2. Think about what objects are attracted to the magnet or not.
3. Give it a try based on your ideas. Classify objects into two groups; objects attracted to the magnet and objects that are not attracted to the magnet.
3. Write the name of the objects in each group in the table.
4. Share your ideas with your classmates. Talk about what objects are attracted to the magnet.

Summary

A magnet attracts magnetic objects.

Magnets can attract some objects. An object that is attracted to a magnet is called a **magnetic object.** Most magnetic objects are made of iron. A magnet attracts iron objects even though their shape, colour and size are different.

Magnetic objects

A steel can is attracted to a magnet, but an aluminium can is not attracted to a magnet. Why?

Some objects are not attracted to a magnet. An object not attracted to a magnet is called a **non-magnetic object.** Non-magnetic objects are made from paper, plastic, glass, or wood.

A magnet cannot attract non-magnetic objects.

Non-magnetic objects

Lesson 3: "Force of Attraction between Magnet and Object"

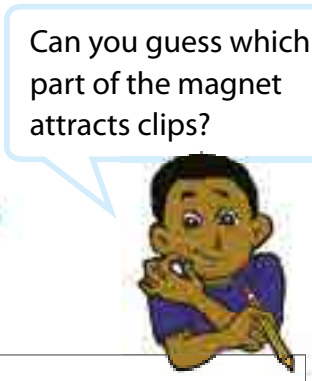
A magnet can attract magnetic objects. Do all parts of a magnet attract magnetic objects?

Which part of the magnet can attract more magnetic objects?

Activity : Attracting as many clips as possible

What We Need:

- bar magnet, clips



What to Do:

1. Draw a diagram like the one shown below in your exercise book.

Prediction		Result	
N	S	N	S

2. Predict which parts of the magnet attract the most clips. Draw your ideas in the diagram.
3. Place the bar magnet on the clips and lift the magnet slowly. Observe which parts of the magnet attract most clips and record your observation in the diagram.
4. Share your ideas with your classmates. Talk about which parts of the magnet attracts most clips.

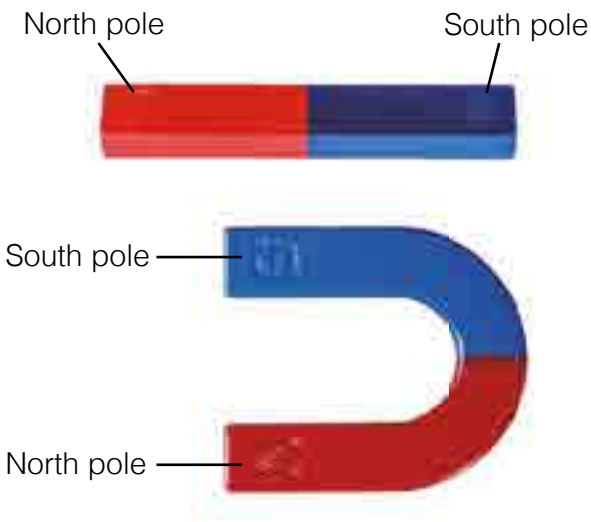
What do you feel when you move a clip on different parts of the bar magnet?

Summary

Two ends of the bar magnet attract more magnetic objects than the other parts of the magnet. The parts where the magnet attracts objects more strongly are called **poles**. The poles have stronger force of attraction than any other parts of the magnet.

The poles attract clips much more than the other parts of the magnet.

A magnet has two poles; the **north pole** and **south pole**. All magnets have two poles even though the shape or size of magnets are different. The poles are in different places on different magnets.



The different shapes of magnets have two poles

Discussion

What happens to a horseshoe magnet?

- Look at the picture shown on the right. What will happen to the horseshoe magnet if we place the magnet horizontally near the clips?

Lesson 4: "Properties of Poles of Magnets"

The poles of a magnet attract more magnetic objects than the other parts of the magnet. Do the poles of magnets have other properties?

What happens if the poles are placed near each other?

Activity : Testing the properties of the poles of a magnet

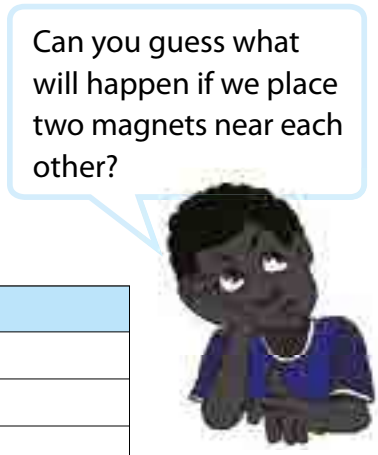
What We Need:

- 2 bar magnets

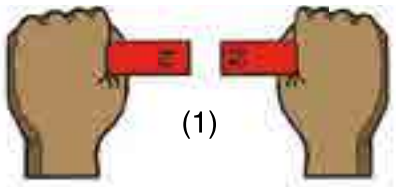
What to Do:

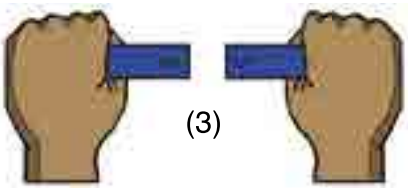
1. Make a table like the one shown below.

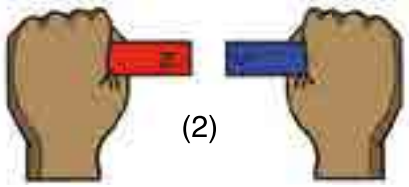
Poles	What happened
(1) North pole and North pole	
(2) North pole and South pole	
(3) South pole and South pole	
(4) South pole and North pole	

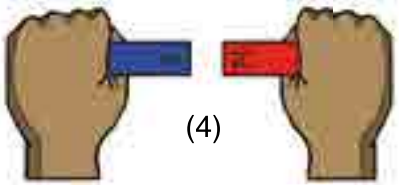


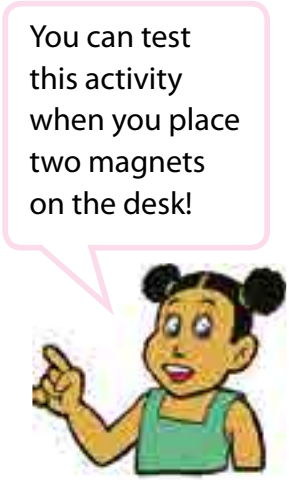
2. Hold two bar magnets and place the poles near each other as shown below.
3. Observe and record what happens to the magnets in the table.
4. Share your ideas with your classmates. Talk about the properties of poles of magnets.









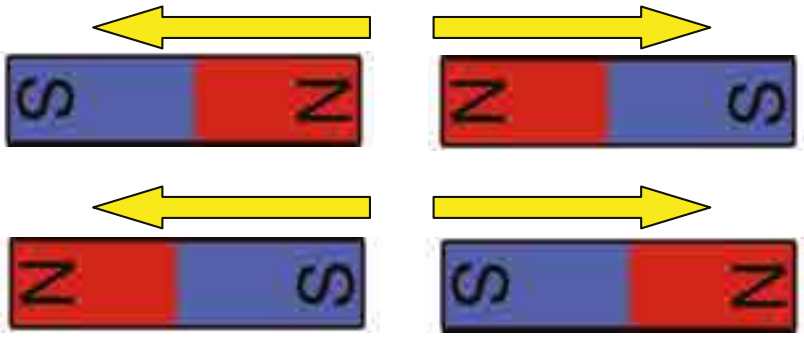


Summary

All magnets **attract** or **repel** other magnets.
If the north pole of one magnet is placed near the south pole of another magnet, the magnets attract each other. When a magnet **attracts** an object, it **pulls** the object towards itself. **Unlike poles of magnets attract each other.**

Unlike poles attract each other.

If the north pole of one magnet is near the north pole of another magnet, the magnets repel. If two south poles of magnets are near each other, the magnets also repel. When a magnet **repels** an object, it **pushes** the object away from itself. **Like poles repel each other.**

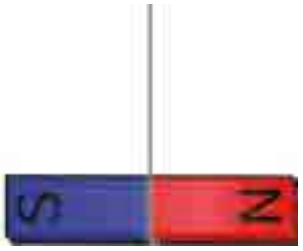


Like poles repel each other.

Discussion

What happens to a magnet?

- Look at the picture shown on the right. A magnet is hang by a thread.
- What will happen to the magnet if we place another magnet near it?



Lesson 5: "Making a Magnet"

A magnet is usually made of iron and can attract magnetic objects. But the iron nail cannot attract magnetic objects even though it is made of iron.

Does an object attracted by a magnet becomes a magnet?

Activity : Can a nail become a magnet.

What We Need:

- bar magnet, iron nails, clips

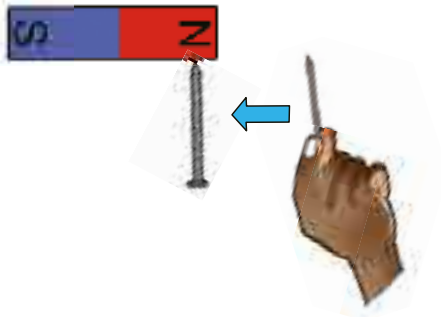
What to Do:

1. Make a table like the one shown below.

	Your observations
When the nail is attached to the paper clip	
When the nail is attached to the magnet	
After the nail is attached to the magnet	

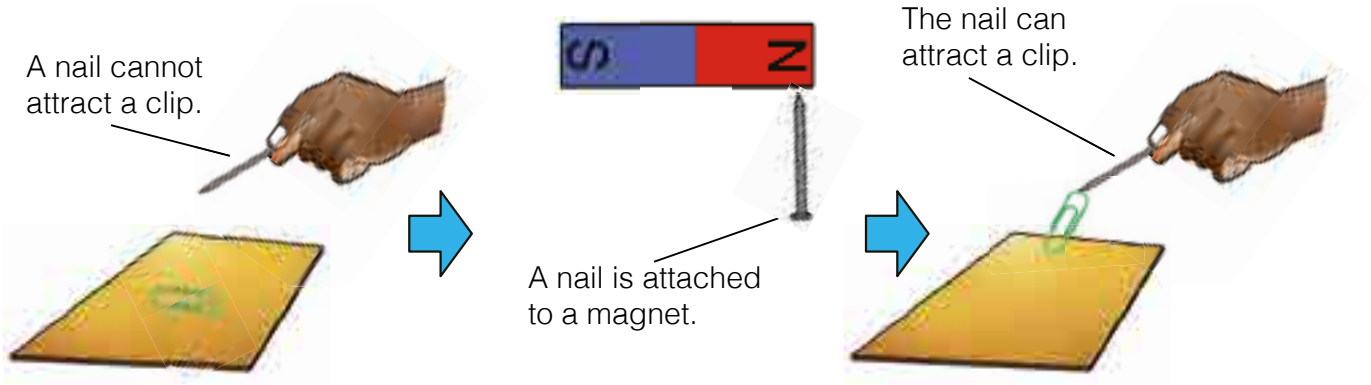
2. Bring the nail close to the clips and observe whether the clips will be attracted to the nail or not. Record your observations in the table.

3. Place the nail on the magnet and then attach another nail to the first nail. Observe what happens to the nails. Record your observations in the table.
4. Take the first nail from the magnet and repeat Step 2.
5. Share your observation with your classmates. Talk about whether the nail becomes a magnet or not.



Result

Before the nail is attached to the magnet, the nail cannot attract a clip.
After the nail is attached to the magnet, the nail can attract a clip.



Once a nail is attached to a magnet, it can attract a clip.

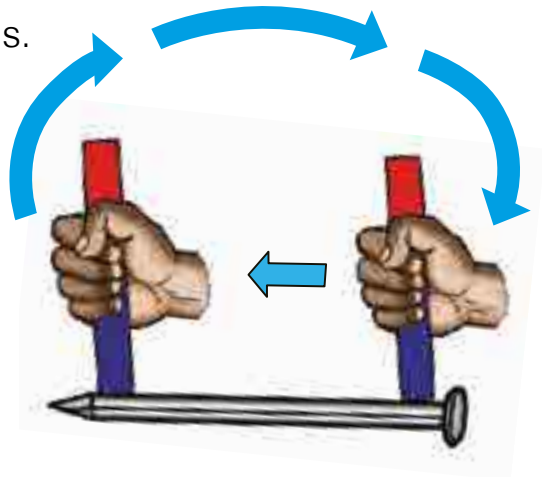
Summary

A nail is made of iron. Once an iron object is attached to a magnet, the object becomes a magnet.

Try it!

Let's make a magnet!

- Prepare a bar magnet, an iron nail and clips.
- Rub the magnet against the iron nail.
  Move it in the same direction, rather than back and forth.
- Continue rubbing the nail with the magnet 50 times as quickly as you can.
- Place the nail near the clips and see if it becomes a magnet!



Lesson 6: "Which Way?"

We use magnets in many ways. Sometimes, we use a magnet to find the direction of where we should go.

How can we find the direction using a magnet?

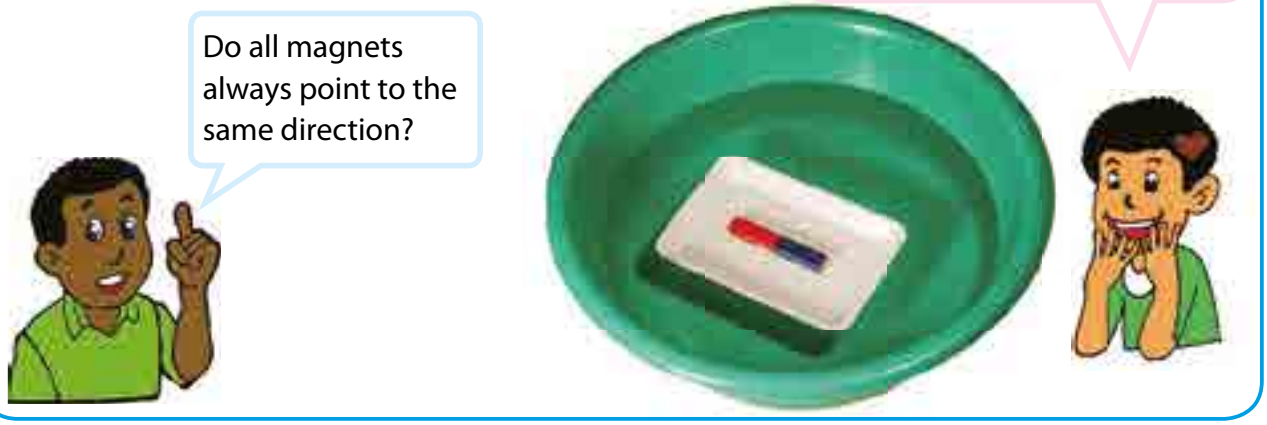
Activity : The direction a magnet points to

What We Need:

- bar magnet, water, plastic basin, plastic tray

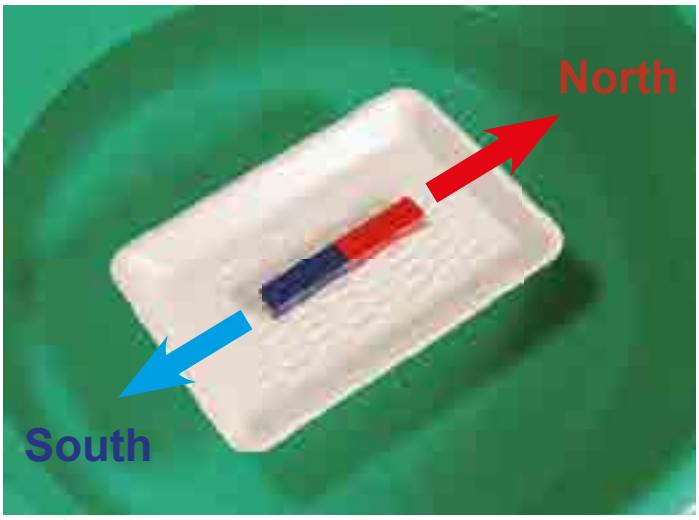
What to Do:

1. Place the magnet on the plastic tray.
2. Float the tray on the water in the basin.
3. Rotate the tray slowly and wait until it comes to rest.
4. Observe the direction the magnet points to and record your observation.
5. Repeat steps 3 and 4 several times and record your observations.
6. Share your ideas with your classmates. Talk about the direction the magnet points to.



Summary

A magnet always points to the same direction. The north pole of a magnet always points to North. The south pole of a magnet always points to South.
This characteristic of the magnets is used in compasses.

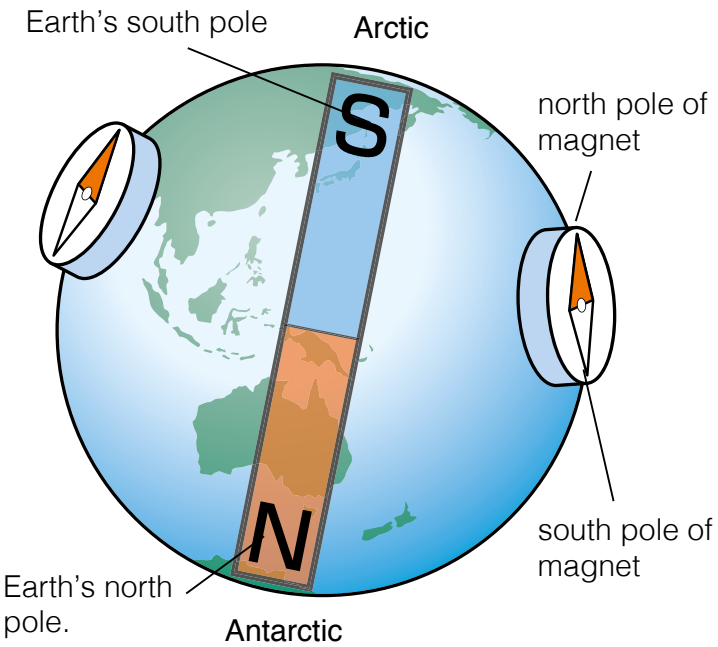


The north pole of the magnet always points North.

A **compass** always points north. We use a compass when we are hiking. A compass helps us find the direction. It can keep us from getting lost.


A compass

A compass always points to the same direction because the Earth is like a big magnet. The Earth's south pole is near the Arctic pole and the Earth's north pole is near the Antarctic pole. The North pole of the magnet is attracted to the Earth's south pole and the south pole of the magnet is attracted to the Earth's north pole.



The Earth is like a big magnet.

Summary and Exercise

Summary 8.1 Properties of Magnet

Properties of Magnet


Bar magnet


Horseshoe magnet


Circular magnet

- Magnets can attract magnetic objects that are made of iron.
- Objects not attracted to a magnet are called non-magnetic objects.

Magnetic objects			Non-magnetic objects			
 Nail	 Safety pin	 Steel can	Plastic spoon	 Glass cup	 Pencil	 Aluminium can

- The parts where a magnet attracts objects more strongly are called poles.
- All magnets have two poles, the north pole and south pole.

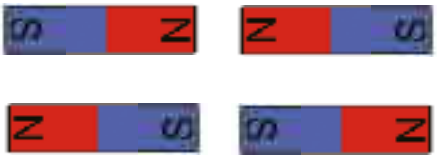
Attracting and Repelling

- Unlike poles of magnets, North - South, attract each other.

Attracting each other

- Like poles of magnets, South - South, North - North repel each other.

Repelling each other



Making a Magnet

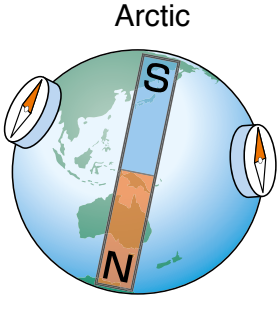
- Once an iron object is attracted to a magnet, the object becomes a magnet

Use of Magnet

- A compass always points north so that if helps us find the direction.


Compass

- The Earth is a big magnet. The earth's south pole is near the Arctic, and the earth's north pole is near the Antarctic



Summary and Exercise

Exercise 8.1 Properties of Magnet

Q1. Complete each sentence with the correct word.

(1) A magnetic object is made of _____.

(2) A magnet has north pole and _____ pole.

(3) The north pole and _____ pole of magnets attract each other.

(4) The north pole and north pole of magnets _____ each other.

Q2. Choose the letter with the correct answer.

(1) Which of the following is the correct explanation about magnets?

A. Some kind of magnets have only one pole.

B. All metals are magnetic objects.

C. An iron nail will become a magnet once the nail is attracted to a magnet.

D. Unlike poles of magnets push away each other.

(2) Which place at the bar magnet will attract more steel clips?

A. Same at any place

B. At both ends

C. On one end only

D. At the centre of the magnet

Q3. Answer the following question.

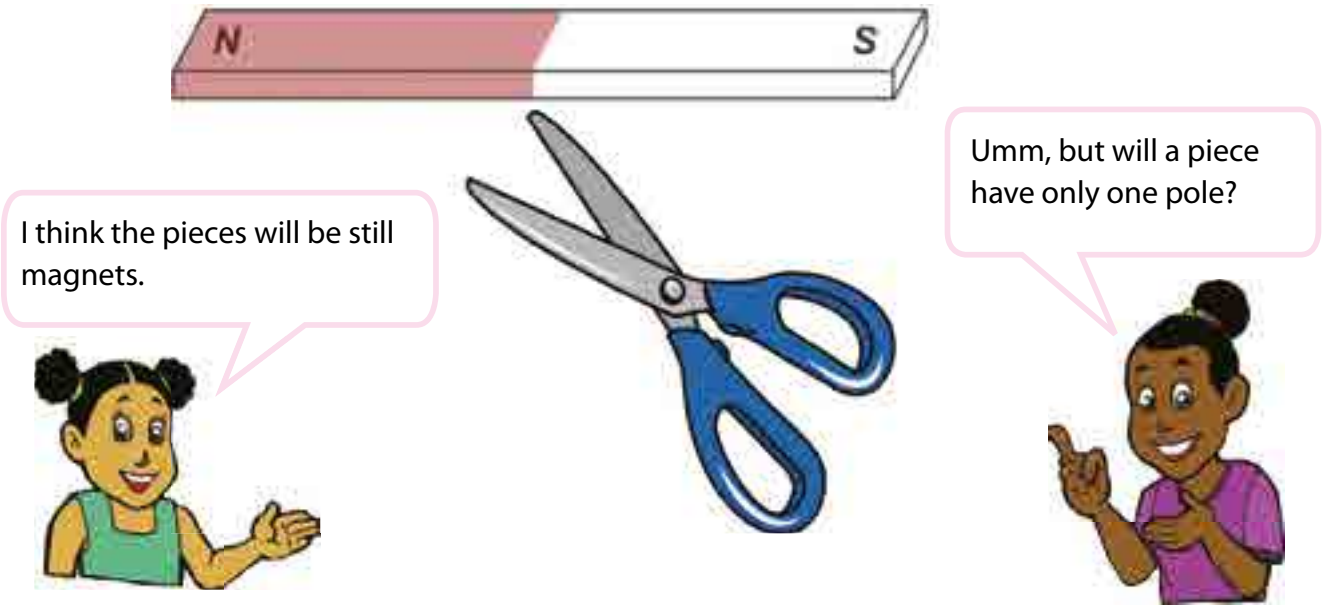
Which of the following objects are attracted by a magnet?

A. Plastic bottle 	B. Iron nail 	C. Text book 	D. Aluminium can 	E. Steel clip 
F. Wood ruler 	G. Rubber band 	H. Scissors 	I. Glass bin 	J. Staples 

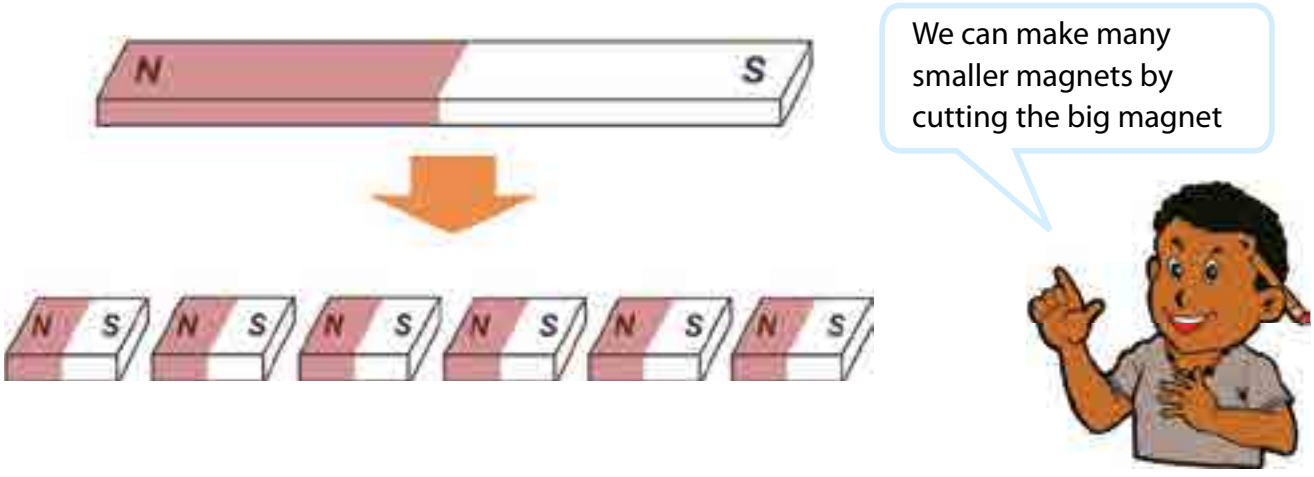
Q4. Explain why the north pole of a compass always points to the North.

What happens when you cut a magnet?

Let's guess what happens when you cut a magnet into two pieces? Do you think the two pieces are still magnets?



When you cut a bar magnet into two pieces, the two pieces are still bar magnet. At the cutting edge, new poles are created, so that the piece has both the north and south poles. In addition, what will happen if the pieces are cut further? Interestingly, a magnet is still a magnet even if it is broken down into small pieces.



Chapter Test

8. Properties of Magnet

Q1

Complete each sentence with the correct word.

(1) A magnet attracts objects made of _____.

(2) Objects attracted by a magnet are called _____ objects.

(3) The two ends of a bar magnet are its _____.

(4) The south and north poles of magnets _____ each other.

Q2

Choose the letter with the correct answer.

(1) Which part of a bar magnet attracts most magnetic objects?

A. Centre of a bar magnet.

B. Two ends of a bar magnet.

C. All parts of a bar magnet.

D. One end of a bar magnet.

(2) Which of the following are non-magnetic objects?

a wooden ruler

an iron nail

a plastic cap

a tin can

staples

A. a ruler and an iron nail

B. an iron nail and a tin can

C. a plastic cap and a tin can

D. a wooden ruler and a plastic cap

(3) What happens when an iron object is attracted to a magnet?

A. The iron object becomes a magnet.

B. The iron object changes its colour.

C. The iron object loses its strength.

D. The iron object pushes the magnet away.

(4) A compass needle always points to the _____.

A. North

B. South

C. East

D. West

Q3

(1) What happens when you put the north pole of one magnet near the south pole of another magnet?

_____

_____

(2) How is a metal paper clip different from a plastic paper clip?

_____

_____

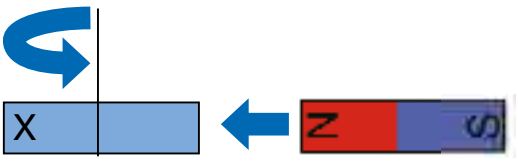
(3) How is a bar magnet similar to a horseshoe magnet?

_____

_____

Q4

Mary hung magnet A as shown in the picture. She didn't know which side of magnet A is north or south pole. When magnet B was brought near to magnet A, magnet A rotated and side "X" faced north pole of magnet B.



Magnet A the Magnet B

From this experiment, explain which pole is side "X" in magnet A, north or south.

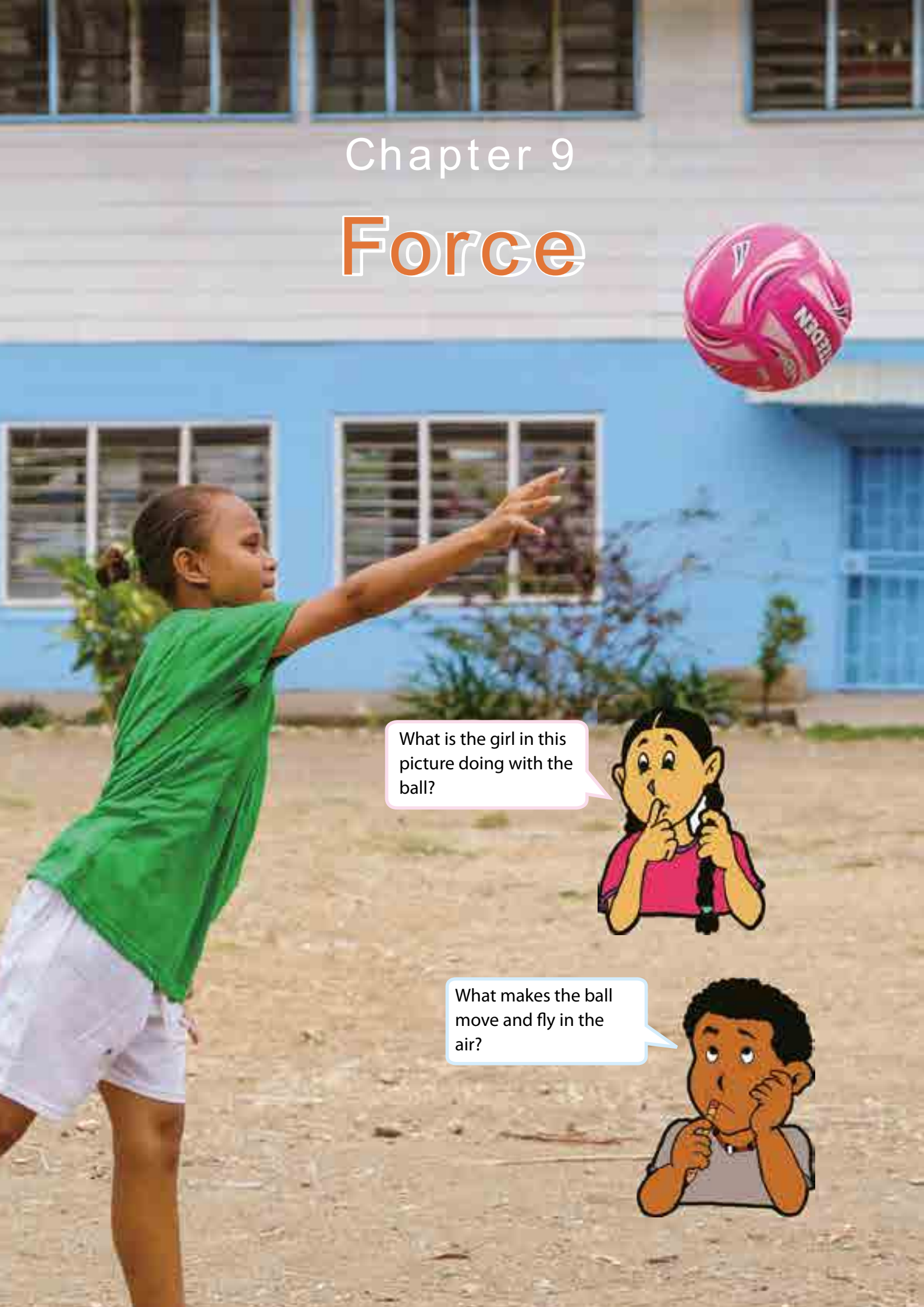
_____

_____

_____

Chapter 9

Force



9.1 Objects in Motion

Lesson 1: "How Objects Move"

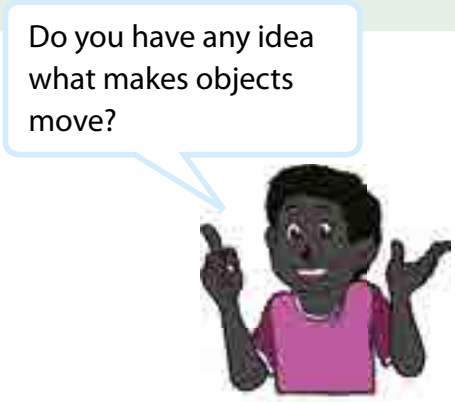
Look around us! A lot of objects are moving. When we play basketball the ball bounces and rolls.

What makes objects move?

Activity : Making objects move

What We Need:

- different objects such as pen, book, and stone



What to Do:

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

Name of Object	How you make it move?

2. Collect different types of objects around you and write the names of the objects in the table.
3. Try to make each object move in many ways, and make a list of how you moved it in the table.
4. Share your ideas with your classmates. Talk about what makes objects move.

Summary

We can move objects by pushing and pulling them. A push and pull is a **force**. When we move an object, we use a force. A force can make objects move. There are different types of forces around us. When we throw or kick a ball, we push the ball. When we zip our clothes, we pull the zipper. When we open a door, we push or pull the door.

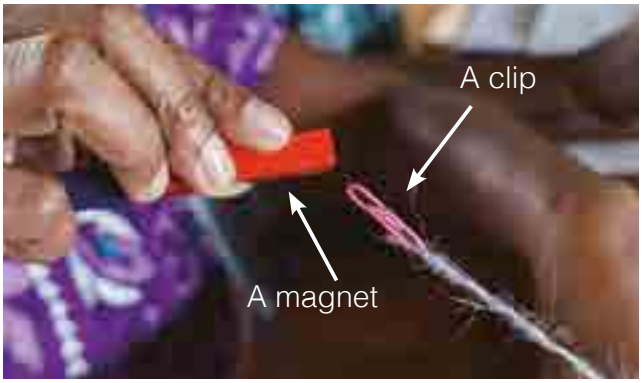
Pushing

Pulling

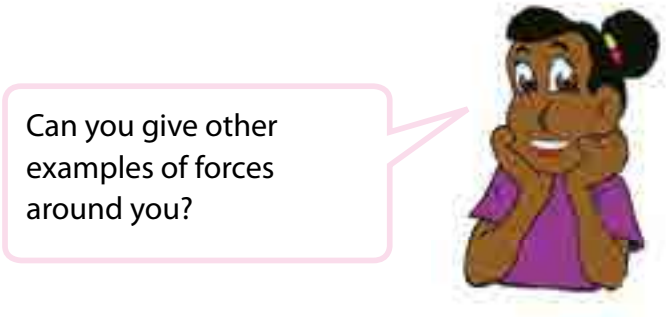
Magnets can move objects because magnets have forces. Iron clip is attracted to a magnet because the magnet pulls the clip.

An object falls to the ground when we drop it because the Earth pulls the object. The force that pulls objects towards the Earth's centre is called **gravity**.

Objects fall down to the ground.



A magnet pulls an iron clip.



Lesson 2: "Push and Pull"

An object moves when we push or pull it. If an object is lighter or heavier, how do we push or pull it?

How do we push or pull a heavy or light object?

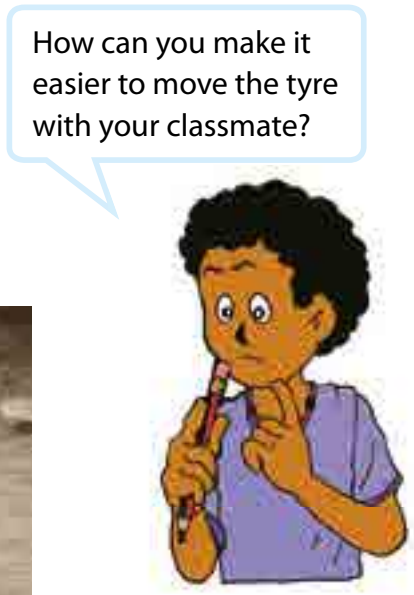
Activity : Pulling and pushing your classmate

What We Need:

- tyres, ropes

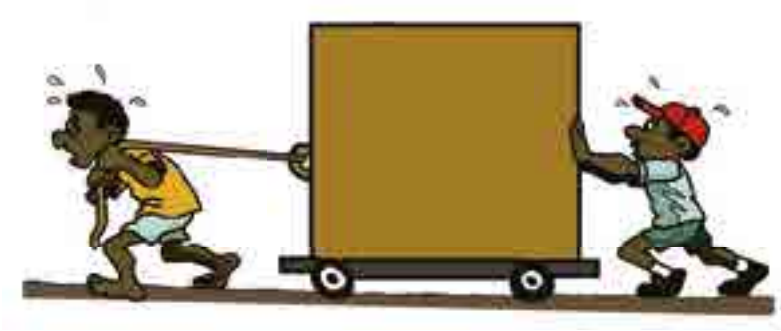
What to Do:

1. Tie the tyre with the rope as shown on the right.
2. Push the tyre by hand and them pull the tyre by holding the end of the rope.
3. Ask one of your classmates to sit on the tyre. Push and pull the tyre.
4. Record how you push or pull the tyre with or without a friend.
5. Share your ideas with your classmates. Talk about how a force affects the movement of the tyre.



Summary

A push or a pull is a force.
A **push** is a force moving something away from us.
A **pull** is a force moving something towards us.



A push and a pull is a force.

We can move heavy object when we push or pull harder. When we move a lighter object, we need a smaller push or pull. A larger force is needed to move a heavy object. A smaller force is needed to move lighter objects.

A small force can move a light object.

A large force is needed to move a heavy object.

A kick is a pushing action. If we kick a ball with a lot of force, the ball goes further. If we kick a ball with a small force, the ball does not go far.

A large force can move a ball further .

Discussion

Which force is stronger?

"Look at the picture shown on the right. They are pulling on the rope, but the rope doesn't move. Which student is using larger force?"

Lesson 3: "Slower and Stop"

When we kick a ball, it travels then slows down and stops. A car slows down and stops when we step on the brake.

What makes things slow down and stop?

Activity : Moving things on surfaces

What We Need:

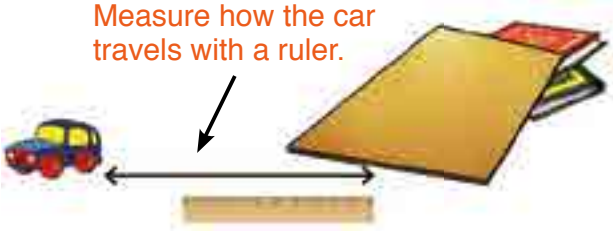
- toy car, books, ruler and cardboard.

What to Do:

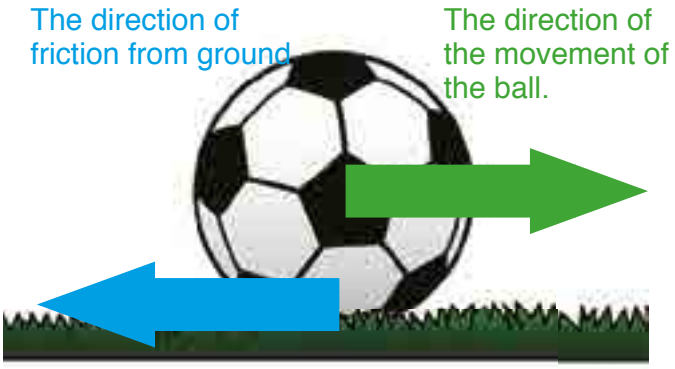
1. Make a table like the one shown below.

	How you feel the surface	How far a car travelled (cm)
Concrete Floor		
Ground		

2. Touch the surfaces of the concrete floor and ground and write how it feels in the table.
3. Put two books on the concrete floor and place the cardboard on the edge of the two books.
4. Let the car off from the top of the cardboard.
5. Measure how far the car travelled using the ruler and record it in the table.
6. Repeat steps 3, 4 and 5 on the ground.
7. Share your observation with your classmates. Talk about which floor the car travelled the furthest and provide reasons.



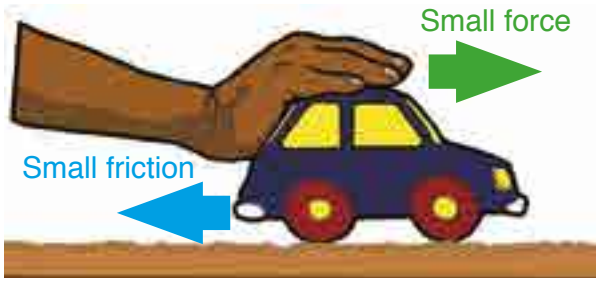
Summary



Direction of friction and movement of a ball.

Moving objects slow down and stop because of forces. A force that makes an object slow down and stop when two surfaces of objects are rubbed against each other is called **friction.**

Friction acts in the opposite direction to the movement of an object. The rougher the surface, the more friction is produced. When we try to push an object on the rough surface, friction makes this more difficult than on smooth surfaces.



Smooth surface

Rough surface

A liquid makes the surface smoother and reduces its friction. We easily slip and fall if we walk across a wet floor because the wet floor reduces friction.


A wet floor is slippery.

Without friction, we cannot grip a cup.

Friction can be useful. Without friction, we cannot grip a pen. If you run down the road, you can stop quickly because of the friction between your shoes and the ground.

Lesson 4: "Speed Up and Slow Down"

Force makes things move. If we apply a force on a moving object, what will happen to the object?

How can force change the movement of things?

Activity : Kicking and catching a ball

What We Need:

- Balls

What to Do:

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

	How does the ball move?
Place the ball on the ground	
Kick the ball slowly	
Kick the rolling ball	
Catch the rolling ball	

2. Go out of the classroom and place the ball on the ground. Observe how the ball moves and record your observations in the table.
3. Kick the ball slowly and then kick the rolling ball again. Observe how the ball moves and record your observations in the table.
4. Catch the rolling ball with your foot. Observe how the ball moves and record your observations in the table.
5. Share your findings with your classmates. Talk about how force changes the movement of the ball.

Summary

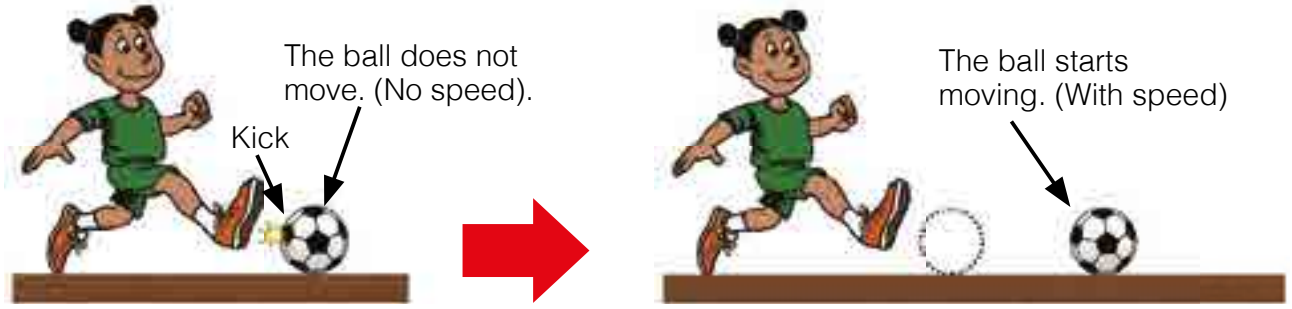
A force can start, move, speed up, slow down and stop an object. In other words, a force can change the speed of an object. **Speed** is a measure of how fast or slow an object is moving.

Kicking and catching are examples of forces.

When we place a ball on the ground, the ball is at rest. The ball at rest does not have speed.

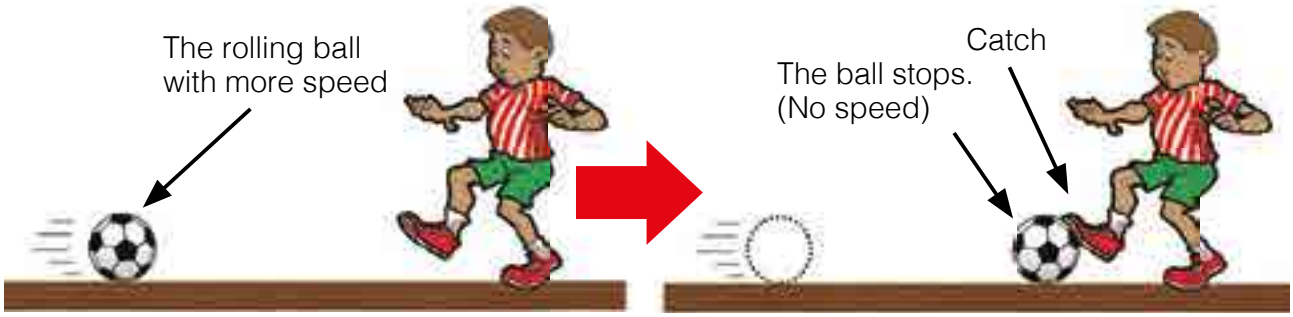
A ball at rest does not have speed.

When we kick the ball slowly, it starts to move and has speed.



We kick the rolling ball again, it moves faster and speeds up.

When we catch the rolling ball, it stops and does not have speed.



Lesson 5: "The Way Objects Move"

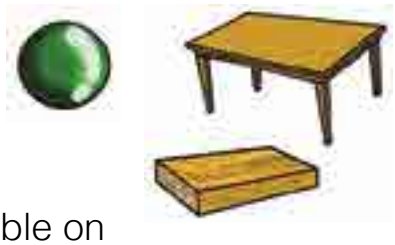
When we bounce a ball, the ball keeps moving down until it hits the ground and it bounces back up. The ball changes the direction from up to down and from down to up.

What makes the direction of things change?

Activity : Passing a marble to friends

What We Need:

- marble, large table, wooden blocks

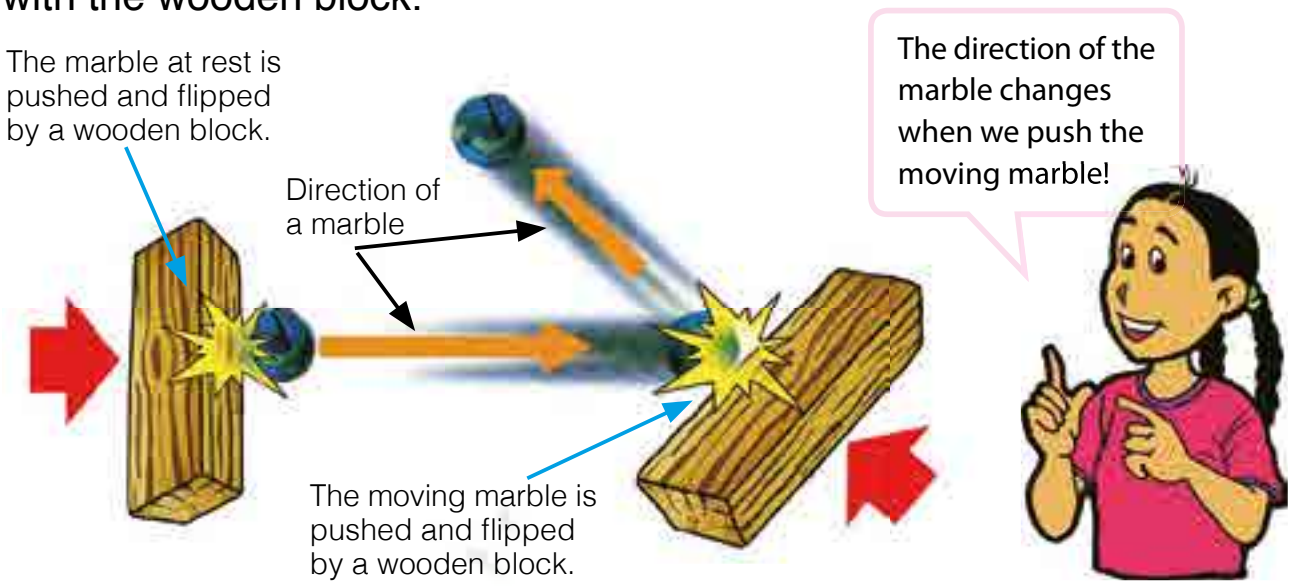


What to Do:

1. Form a group and sit around a table.
2. Hold the wooden block and place the marble on the table.
3. Pass the marble to a friend slowly by using the wooden block.
4. When the marble comes to you, try to pass it to another friend.
5. Continue this play until the marble falls off the table.
6. Think about the following questions:
   - Did the direction of the moving marble change when you passed it to your friends?
   - How did you change the direction of the moving marble?
7. Share your ideas with your classmates. Talk about what makes a moving marble change its direction.

Result

When we pushed and flipped the marble at rest with a wooden block, the marble started to move straight. The marble moved straight in the different direction when we pushed and flipped the moving marble with the wooden block.



Summary

Pushing and flipping are example of forces. When we push and flip a moving marble, we can change the direction of the moving marble.

This means that **a force can change the direction of a moving object.**

Direction is the path that an object takes. The direction tells us where the object is going. A force makes the direction of a moving object change.

Lesson 6: "More about Forces"

A force can make things move, speed up, slow down and stop. A force also changes the direction of things.

What else can force do?

Activity : Use your force!

What We Need:

- empty plastic bottles without a cap, clay

What to Do:

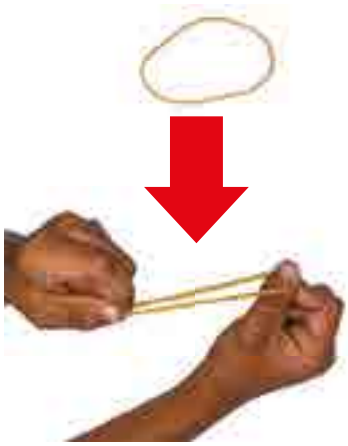
1. Make a table like the one shown below.

What happened to the things?

2. Apply different types of forces to the empty plastic bottle and clay.
3. Record what happened to the plastic bottle and clay in the table.
4. Share your findings with your classmates. Talk about what forces can do.

Summary

A force can change the shape of an object. For example, we create new shapes of clay when we push, press or pull clay. When we pull a rubber band, we change its shape.



A force changes the shape of rubber band and clay.

A force can also change the size of an object. Size tells us how big or small an object is. For example, an empty bottle shrinks when we crush it. Sometimes we see crushed cans on the road because cars press the cans.

A force changes the size of the bottle and can.

Discussion

More about forces?

1. Give examples from daily life where forces may change the shape and size of things.
2. Talk about your ideas with your classmates.

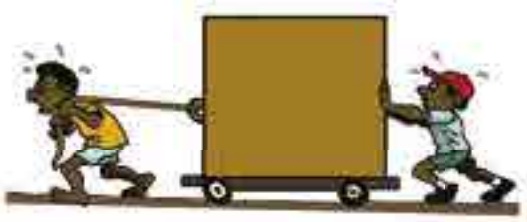
Summary and Exercise

Summary 9.1 Objects in Motion

Forces

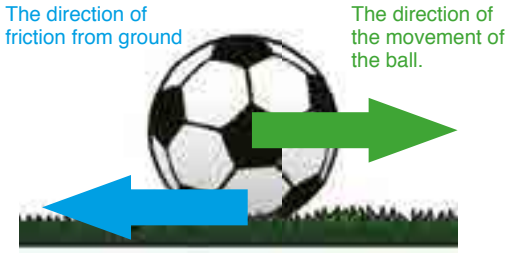
A force is a push or a pull.

- A push is a force moving something away from us.
- A pull is a force moving something towards us.



A force can make an object slow down and stop

A force that makes an object slow down and stop when two surfaces of objects are rubbed against each other is called friction.



A force can change speed

- A force can change the speed of an object.
- Speed is a measure of how fast or slow an object moves.

A force can change direction

- A force can change the direction of a moving object.
- A direction is the path that an object takes.

A force can change shape and size

- A force can change the shape of an object.
- A force can also change the size of an object.

Summary and Exercise

Exercise 9.1 Objects in Motion

Q1. Complete the sentence with the correct word.

(1) How fast or slow an object moves is called _____.

(2) A _____ is a push or a pull.

(3) The path a moving object follows is called _____.

(4) A force can change the _____ and size of an object.

Q2. Choose the letter with the correct answer.

(1) Which of the following is <u>not</u> correct about force?

A. It makes objects slow down and stop.

B. It can change the speed and direction of a moving object.

C. It can change the shape and size of an object.

D. It can change the weight of an object.

(2) Which action is <u>not</u> a pull force?

A. Kicking a ball

B. Raising a flag up a flagpole

C. Combing hair

D. Dragging a heavy bag

Q3. Answer the following questions.

Look at the picture on the right. What force is applied by the kids to move the car backward?

Q4. John pushes a box across a rough concrete floor. Mary pushes a box across a smooth tile floor. The boxes have the same weight. Which box will slide more easily? Why?

9.2 Simple Machine

Lesson 1: "What is a Simple Machine?"

Think of your home. We can find a lot of tools that help us do things easier. For example, we use an axe to cut down a tree. An axe makes it easier to cut a tree.

? What tools help us do things easier?

Activity : Finding tools that help us

What to Do:

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

Name of Tool	How do we use it?
e.g. axe	e.g. We use it to cut a tree.

2. Make a list of tools that help us do things easier and how we use them in the table.
3. Share your ideas with your classmates. Talk about how these tools help us to do things.

Summary

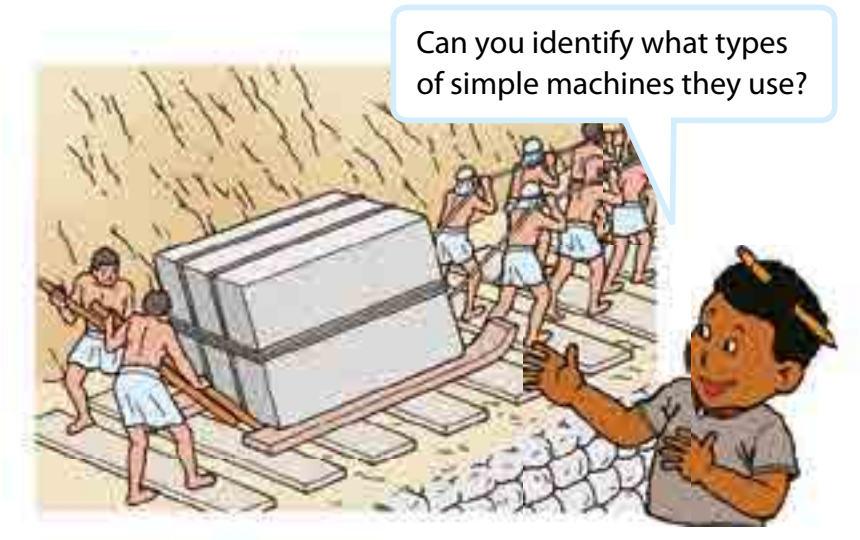
We use many tools to do things easier. When we cut papers, we use scissors. Scissors can help us cut papers easily. We turn a doorknob to open the door. A wheelbarrow can make it easier to carry an object. A tool that helps us do things easier is called a **simple machine**. There are different types of simple machines such as lever, pulley and ramp.

A doorknob makes it easier to open the door.

A wheelbarrow makes it easier to carry objects.

Scissors helps to cut papers easily.

Simple machines have been used for a very long time. Early people began using them to push, pull, lift, divide and crush things. Today there are many types of simple machines in every place and all around us.



Lesson 2: "Inclined Plane"

An inclined plane is one of the simple machines. It has a flat surface connecting a lower place to a higher place.

How does an inclined plane work?

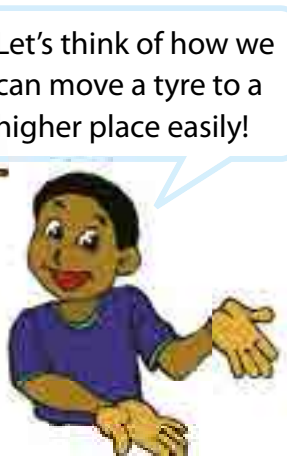
Activity : Lifting up a tyre

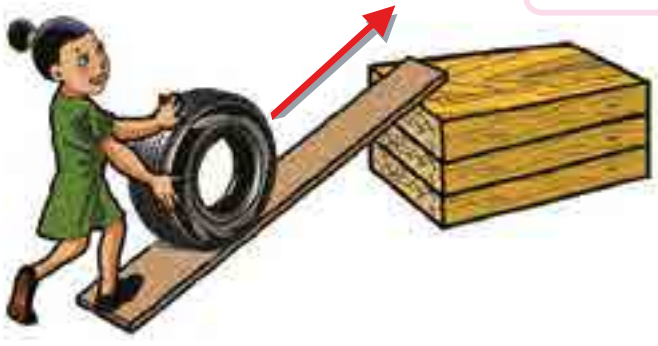
What We Need:

- tyre, a flat wooden board

What to Do:

1. Place the tyre on the ground, and try to lift it straight up onto a step.
2. Place the board on the edge of a step. Try to move the tyre from the ground onto a step using the board.
3. Record which way is easier to move the tyre from the ground onto the step.
4. Share your ideas with your classmates. Talk about how an inclined plane helps us.





Summary

An **inclined plane** is a simple machine made up of a flat and slanted surface. An inclined plane can help move heavy objects easier from one level to another.

Inclined plane: Ramp

A ramp or a wheelchair ramp are examples of inclined planes.

If we need to move a heavy object from the ground onto the truck, we could use less force to move the object up a ramp than to lift it straight up.

A stronger force is used to lift boxes straight up.

A ramp helps move boxes easier.

A ramp is also used as a wheelchair ramp. A ramp makes it easier to push a wheelchair up or down.

A ramp makes it easier to push the wheelchair up.

Lesson 3: "Lever"

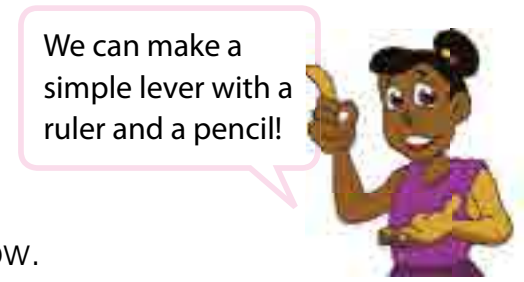
Lever is another simple machine. A lever has a bar that moves around a fixed point. We can find levers everywhere in our daily life.

How does a lever work?

Activity : Making a simple lever

What We Need:

- pencil (or thin marker), wooden ruler (or wooden bar), book

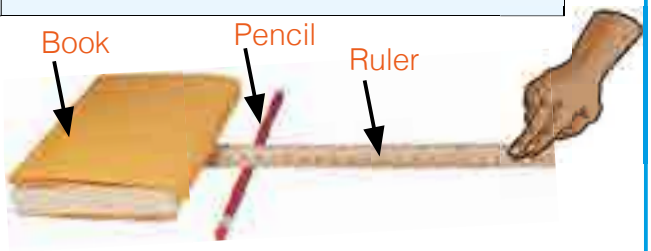


What to Do:

1. Make a table like the one shown below.

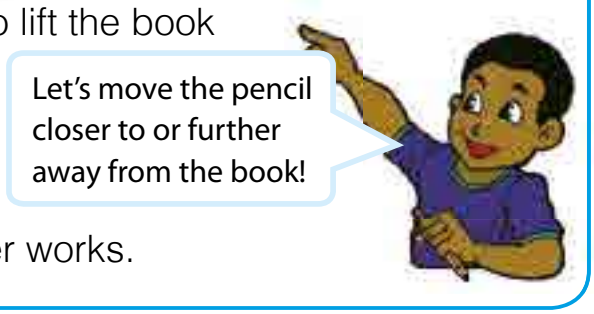
Which direction does the book move?	Where did you put the pencil to lift the book easily?

2. Make a lever with the pencil and the ruler as shown on the picture on the right.

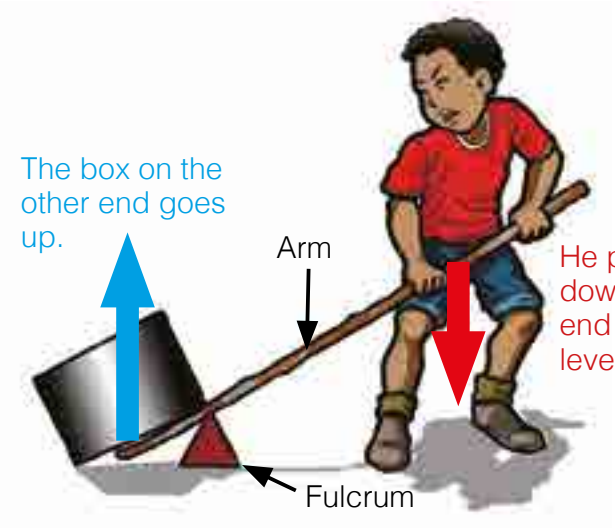


3. Put the book on one end of the ruler. Press the other end of the ruler down and observe which direction the book moves.

4. Move the pencil to different places on the ruler and find how to lift the book easily.
5. Record your findings in the table.
6. Share your ideas with your classmates. Talk about how a lever works.

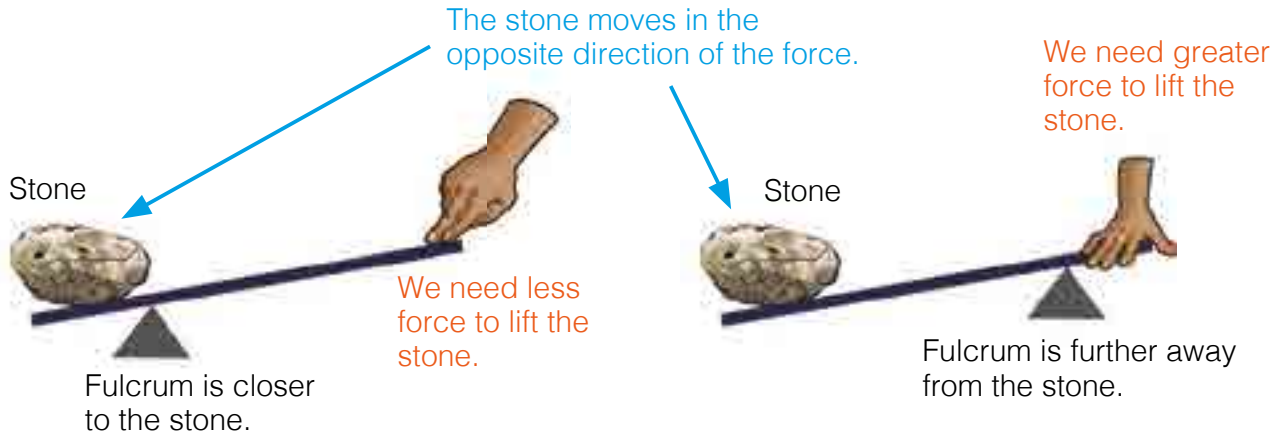


Summary

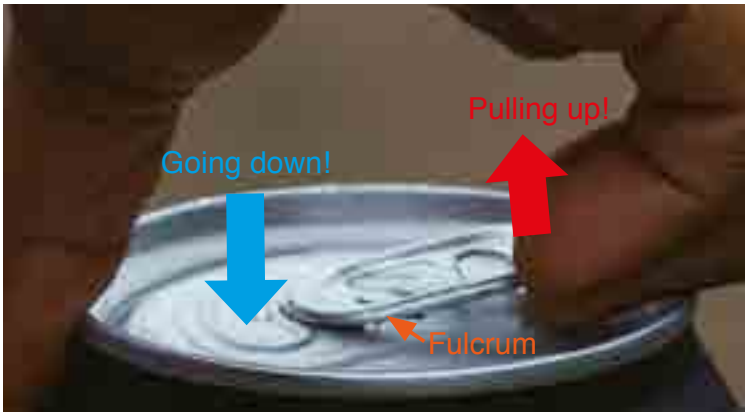


He is pushing down a lever to lift up a box.

A **lever** is a simple machine made up of an arm and a fulcrum. The bar or handle of the lever is called the **arm**. The **fulcrum** is the point on which the lever turns or balances. A lever makes it easier to lift and move objects. When we push down one end of a lever, the other end will go up in the opposite direction. A lever can change the direction of the force. The closer the fulcrum to an object on one side of the lever, the easier it is to lift the object. The further the fulcrum is from the object, the greater the force needed to lift the object.



A lever is a very useful simple machine.
We can find levers everywhere. Examples of levers are flip top and shovel.



Flip top is a lever.

Lesson 4: "Pulley"

A pulley has a wheel and a rope. We use pulleys in different ways in our daily lives.

How does a pulley work?

Activity : Lifting up objects

What We Need:

- pulley, string ,a bottle of water

How We Do:

1. Make a table like the one shown below.

	In which direction does it move?	
	Bottle of Water	Your Pulling
Without a pulley		
With a pulley		

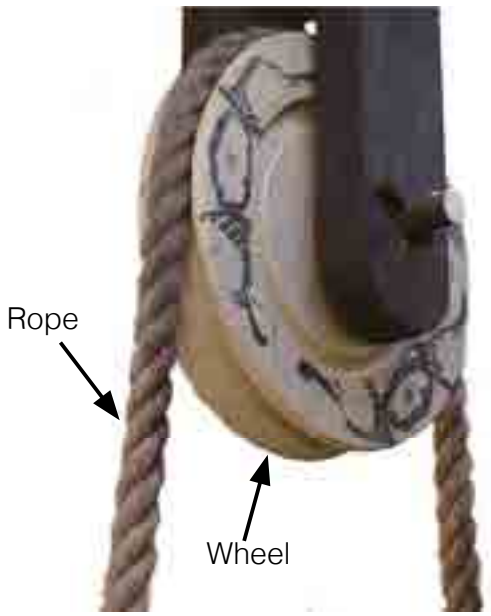
2. Tie one end of the string around the bottle of water and lift up the bottle by pulling the string without the pulley.
3. Set up the pulley like the picture on the right and then pull another end of the string to lift the bottle.
4. Record which direction you pulled the string and which direction the bottle moves with and without the pulley.
5. Share your ideas with your classmates. Talk about how a pulley works.

Summary

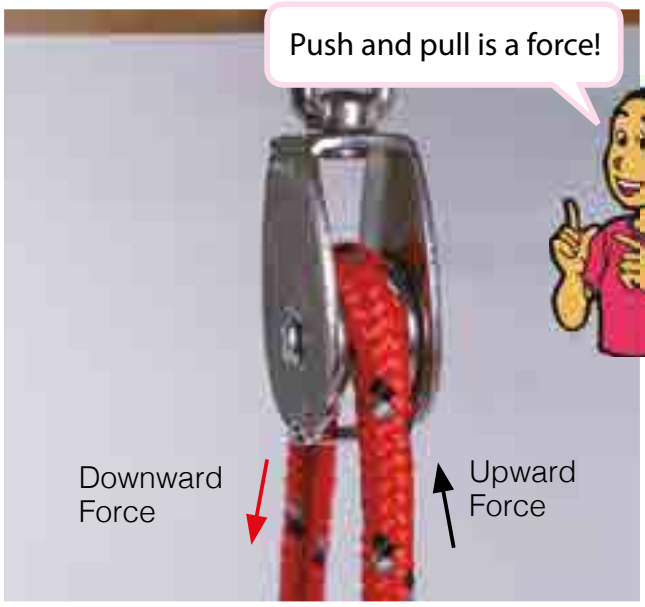
A **pulley** is a simple machine made up of a wheel through which a rope moves. A pulley helps us to lift an object.

When we lift up an object to a higher position, we use a pulley.

If we pull down one end of the rope, the object goes up. A pulley changes the direction of a force.



A Simple Machine: Pulley



A pulley changes the direction of force.

Examples of uses of pulleys are flagpole, well and crane.

Flagpole

Water well

Crane

Summary and Exercise

Summary 9.2 Simple Machine

What is a Simple Machine?

- ☑ A tool that helps us do things easier is called a simple machine.
- ☑ There are different types of simple machines such as inclined plane, lever and pulley.

Inclined Plane - It is a simple machine made up of a flat and slanted surface. - It can help move heavy objects easier from one level to another.	
Lever - It is made up of an arm and a fulcrum. The arm is a bar or handle of the lever and the fulcrum is the point on which the lever turns or balances. - It can help to lift and move heavy objects easily.	
Pulley - It is made up of a wheel through which a rope moves. - It helps to lift objects to a higher position. - It changes the direction of the force.	

Summary and Exercise

Exercise 9.2 Simple Machine

Q1. Complete each sentence with the correct word.

(1) A tool that makes do things easier is called a simple_____.

(2) A simple machine made up of an arm and a fulcrum is a _____.

(3) A simple machine that is made up of a rope and a wheel is a _____.

(4) A simple machine that has a slanted surface is an _____.

Q2. Choose the letter with the correct answer.

(1) Which of the following is an example of an inclined plane?

A.  scissors

B.  ramp

C.  door knob

D.  pulley

(2) What type of simple machine is a scissors?

A. Inclined plane

B. Pulley

C. Lever

D. Wedge

Q3: Answer the following questions.

Look at the picture on the right.

(1) What type of simple machine is it?

(2) What is it used for?

Q4. A student wants to look under a heavy rock. Which simple machine would be BEST used to lift the rock?

How do we travel into space?

When you throw an apple up, the apple must fall back to the ground. Is it possible to send objects into the space? Using rocket is a way to send objects into space! The rocket can create a large upward force by burning up the fuel and the force makes its heavy body lift off the ground. The rocket can fly upward and straight into the space!

Large force makes the rocket lift off the ground!

Chapter Test

9. Force

Q1

Complete each sentence with the correct word.

(1) A push or a pull is called a _____.

(2) A force that makes an object slow down and stop when two surfaces of objects are rubbed against each other is called _____.

(3) There are different types of simple _____ such as lever, pulley and inclined plane.

(4) How fast or slow an object moves is called _____.

Q2

Choose the letter with the correct answer.

(1) What must be applied to make objects move?

A. Direction
B. Force
C. Speed
D. Distance

(2) When you release a ball from your hand, which force causes the ball to fall back to the ground?

A. Friction
B. Gravity
C. Magnetism
D. Electricity

(3) How does a simple machine make work easier?

A. Takes less force to move something heavy.
B. Changes the weight of something heavy.
C. Improves the way something looks.
D. Makes something become a different shape.

(4) A slide and a ramp are examples of what type of simple machine?

A. Lever
B. Pulley
C. Wedge
D. Inclined plane

(5) Which of the followings is <u>not</u> an explanation about force?

A. A force can make an object slow down.

B. A force can start to move an object.

C. A force can change the colour of an object.

D. A force can change the direction of a moving object.

Q3

(1) Look at the picture on the right. Paul pulls down on the rope of the pulley. In which direction does the bottle move?

_____

(2) Samuel is pushing a wheelbarrow. When he puts some heavy objects on it, does he need to apply larger force or smaller force to move the wheelbarrow?

_____

Q4

(1) How does an inclined plane make work easier?

_____

_____

(2) Friction can be useful for our life. Suggest two examples of what would happen if there is no friction in our daily life?

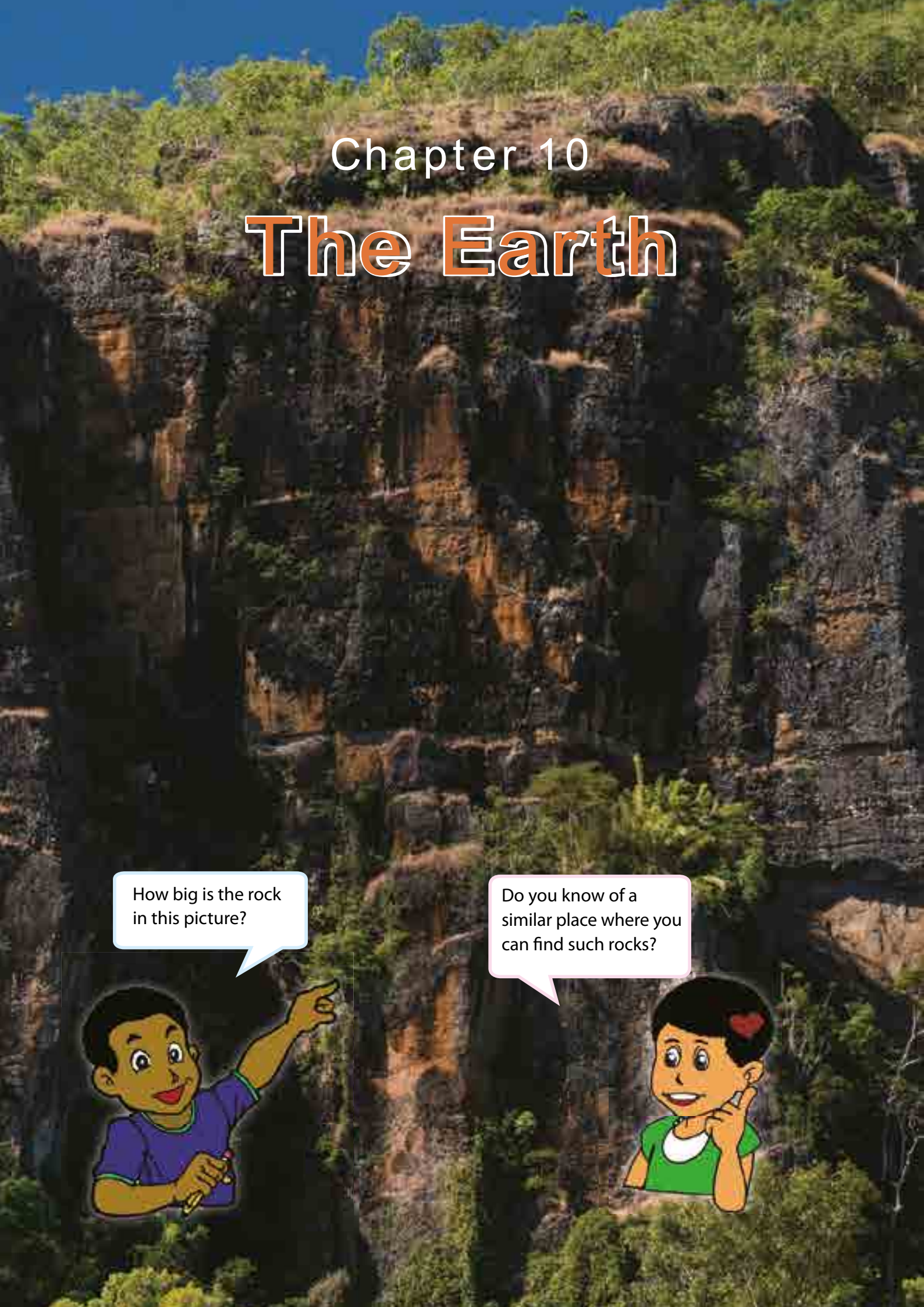
_____

_____

_____

Chapter 10

The Earth



10.1 Surface of The Earth

Lesson 1: "Covering the Earth"

We live on the Earth. Plants and animals also live on the Earth. It is important for living things. What is Earth? Let's study the Earth.

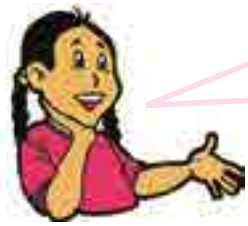
? What is the surface of the Earth covered with?

Activity : Earth's surface

What to Do:

1. Look at the picture below. The picture shows our Earth taken from space.

2. Think about the following questions when observing the Earth carefully:
   - We can see different colours of different parts on the Earth. The white parts show the clouds. What do the green and brown parts show?
   - What is the blue part on the Earth?
   - Which part covers the surface of the Earth more, the green and brown parts or the blue part?
3. Share your ideas with your classmates. Talk about what the surface of our Earth is covered with.



Summary

The Earth's surface is covered with water and land. Almost three quarters of the Earth's surface is water.

Water

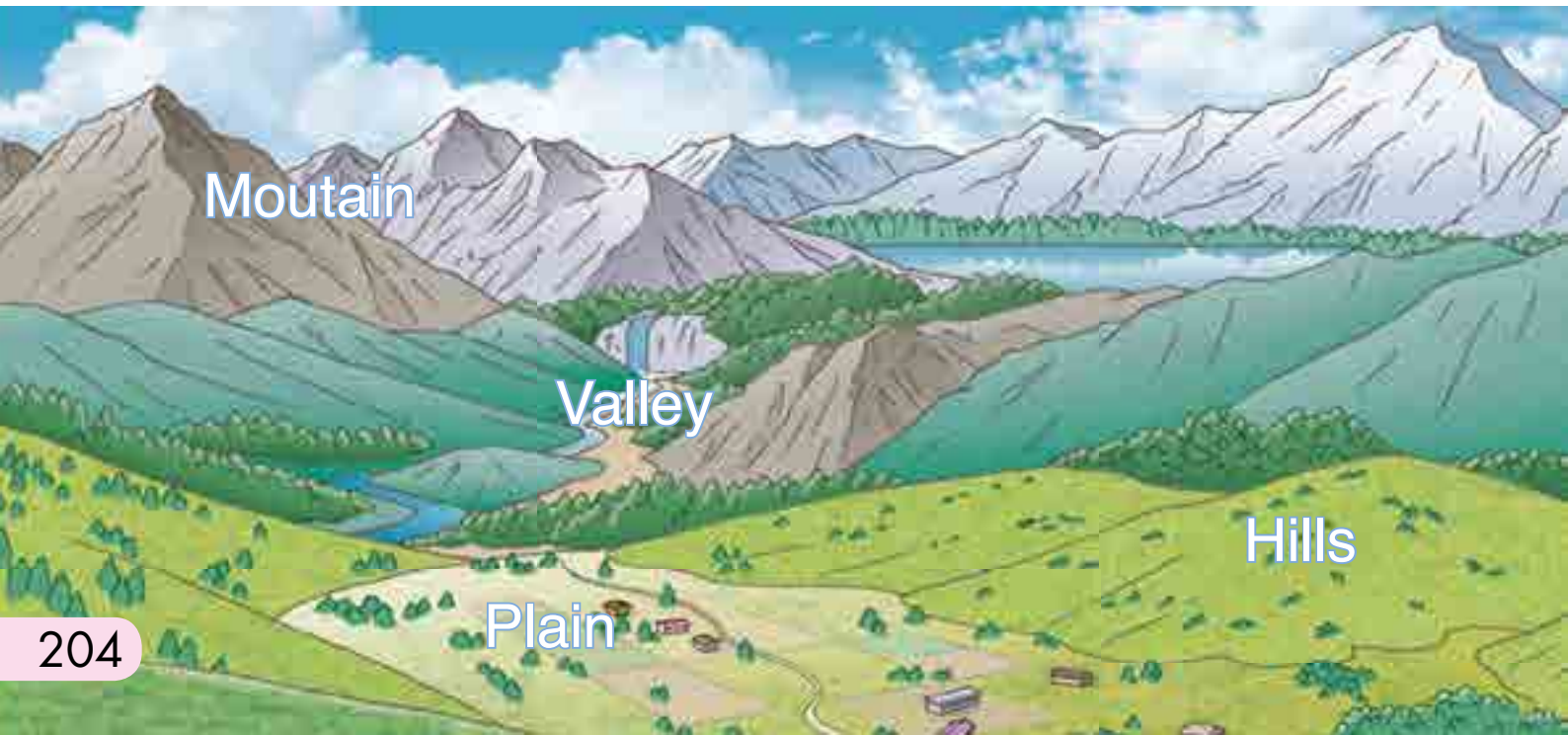
Water covers most of the Earth's surface. Most of the Earth's water is salt water. We can find salt water in the oceans and seas. A different kind of water is fresh water. Fresh water can be found in streams, rivers, or lakes.

Salt Water: Ocean

Fresh Water: River

Land

Earth's surface is also covered by land. Land has several different features. Mountains, hills, valleys and plains make up the land.



Lesson 2: "Rocks"

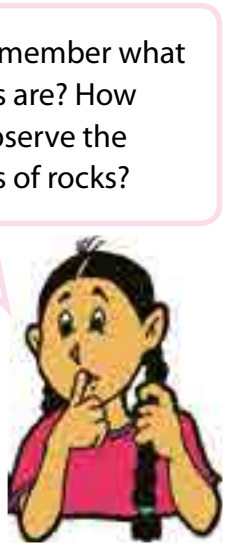
We can find rocks around us, but do you know what rocks are? What are rocks made of? Are there different kinds of rocks? What properties do rocks have?

What is a rock?

Activity : Observing rocks

What to Do:

1. Make a table like the one shown below.
2. Go out of your classroom and fetch two different rocks.
3. Sketch each rock in the table.
4. Observe the rocks carefully and write the properties of each rock in the table.
5. Share your ideas with your classmates. Talk about the properties of each rock and how they are alike or different.



	Rock A	Rock B
Sketch		
Properties of rock		

Summary

There are many kinds of rocks. Limestone, sandstone and granite are examples of rocks. Conglomerate and marble are also rocks. Each rock is different from other rocks. Some rocks are dark coloured and some are light coloured. Some rocks are harder or softer than others.

Rocks


Limestone


Sandstone


Conglomerate


Granite


Marble

A rock is made of one or more **minerals**. A mineral is a non-living thing found in nature. There are many different kinds of minerals on the Earth. Gold, diamond and copper are examples of minerals.

Minerals


Copper


Amethyst


Silver


Diamond


Gold


PNG has many minerals. The rock above contains Copper and Gold which was found 15m blast-hole in Southern Highlands Province.

Lesson 3: "Soil around Us"

Look outside. We can see soil around us. What do you know about soil? Rocks are made of minerals but what is soil made of?

What is soil made of?

Activity : Observing soil

What We Need:

- a clear plastic bottle, soil, water

What to Do:

1. Go out of the classroom and collect some soil.
2. Put the soil into the plastic bottle and pour water into the bottle.
3. Screw on the cap tightly and shake the plastic bottle well.
4. After a while, sketch the mixture of soil and water in your exercise book.
5. Observe the mixture carefully and record what you found in the mixture.
6. Share your ideas with your classmates. Talk about what makes up soil.

Summary

Soil is the top layer that covers the Earth's surface. Soil is made of stones, gravels, sand and clay. Soil also has air, water and small pieces of things such as the dead insects bodies and pieces of leaves, wood and bark.

The small pieces of things in the soil have broken down, mixed together and changed into something over time. This is called **humus**. Humus is usually black or dark brown colour. Humus helps plants grow well.

Humus

Lesson 4: "Properties of Soil"

There are different types of soil. Sandy soil, loamy soil and clay soil are examples of different types of soil. How are they alike or different?

What properties do soils have?

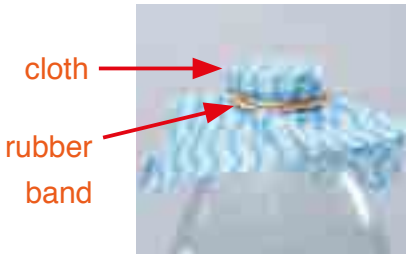
Activity : Comparing soils

What We Need:

- sandy soil, loamy soil, clay soil, water, three plastic bottles, cloth, rubber bands

What to Do:

1. Observe three kinds of soils and record the properties of each soil.
2. Cut off the top of the plastic bottles and make three funnels with the rubber band and a piece of cloth. Place the funnels on the bottom part of the plastic bottles.
3. Pour one type of soil into each funnel and then pour water into the funnels.
4. Observe how fast water can pass through each soil. Record your observation in your exercise book.
5. Share your ideas with your classmates. Talk about the properties of each soil and how they are alike or different.



Summary

Different types of soil have different properties such as colour, texture, size of particles, the substances it contains and how fast water can pass through the soil. Sandy soil, loamy soil and clay soil also have different properties.

Sandy Soil

The colour of sandy soil is often tan or light grey. The size of sandy soil particles is larger than clay soil. It feels dry and gritty. Water can pass through sandy soil quickly.

Sandy soil

Loamy Soil

Loamy soil is dark in colour. It feels coarse, soft and dry. Loamy soil contains various sizes of particles. Loamy soil holds onto water, but it lets water pass through well.

Loamy soil

Clay Soil

The colour of clay soil is often brown, red or yellow. The particles of clay soil are the smallest among the three types of soils. It feels sticky when wet but smooth when dry. Water can pass through clay soil slowly.

Clay soil

Lesson 5: "Importance of Soil for Plants and Animals"

Soil is very important for plants and animals to survive. How does soil help plants and animals to survive?

Why is soil important for plants and animals?

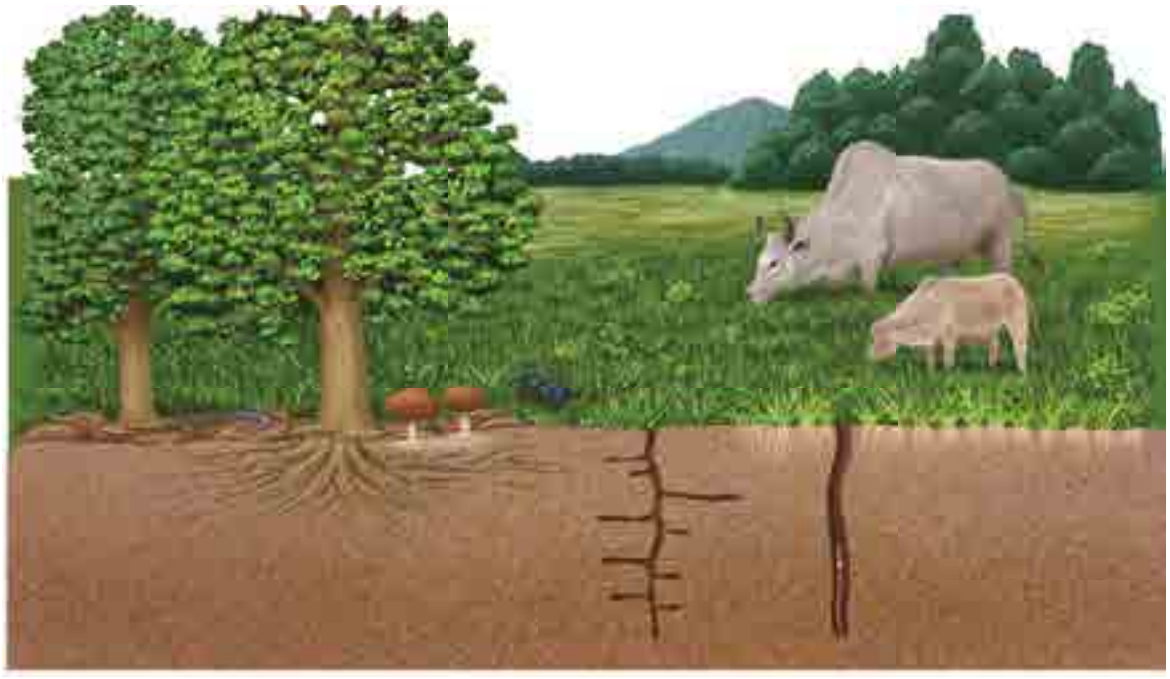
Activity : How plants and animals use soil

What to Do:

1. Make a table like the one below.

Living things	How do plants and animals use soil?
Plants	
Animals	

2. Look at the picture below and think about how plants and animals use the soil to survive. Write your ideas in the table.
3. Share your ideas with your classmates. Talk about why soil is important for plants and animals.

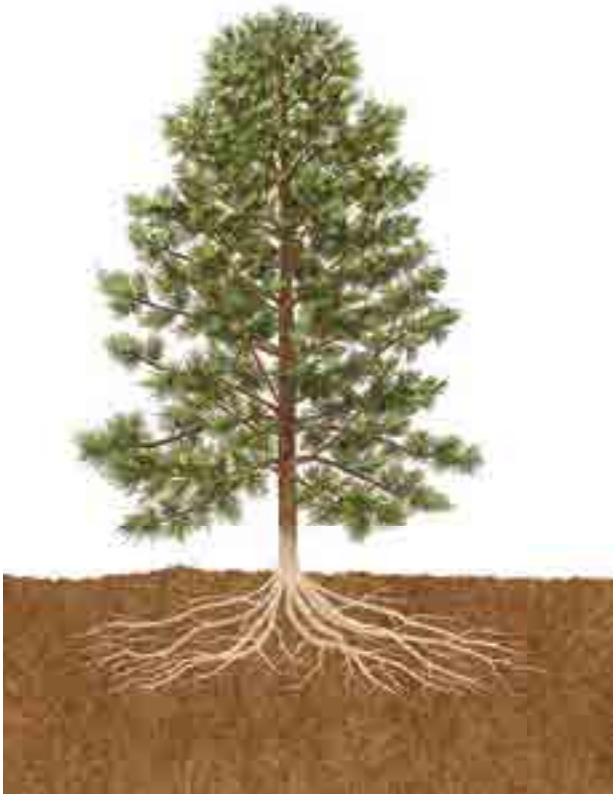


Summary

Plants and animals depend on the soil to live and grow in many ways.

Plants

Soil helps plants grow and live. Plants depend on soil for space to live. Soil supports roots and keeps plants upright for growth. Soil contains water and humus in it. Plants use the water to live and the humus to grow well.



Plants depend on soil in many ways.

Animals

Soil is important for animals too. Animals depend on soil for food. Plants grow in soil. Some animals eat the plants grown on the soil. Soil provides many animals with a place to live. Some animals such as insects or moles live in soil safely.

Some animals eat plants that grow on soil.

Some insects and other animals use soil as a place to live.

Some crabs also use soil as a living place

Summary and Exercise

Summary 10.1 Surface of the Earth

Surface of the Earth

- The Earth's surface is covered with water and land.
- Water covers most of the Earth's surface. Land covers the rest of it.
- There are two types of water covering the Earth's surface, salt water and fresh water.

Rocks

- There are many kinds of rocks and minerals. They are non-living things. A rock is made of one or more minerals.

Rocks			Minerals		
					
Granite	Sandstone	Marble	Copper	Gold	Amethyst

Characteristics of Soil

- There are different types of soil.

Type	Sandy soil	Loamy soil	Clay soil
Example			
Colour	Tan or light grey	Dark colour	Brown, red or yellow
Particle size	Larger than clay soil	Various sizes	Smallest in all soils
Texture	Gritty and dry	Coarse, soft and dry	Sticky (wet) / smooth (dry)

- Use of soil for plants and animals.

Plants	Animals
- Plants grow root into soil and the soil supports it to keep it upright. - Plants use water and humus in soil.	- Some animals eat plants that grow on the soil. - Soil provide animals with safe homes.

Exercise 10.1 Surface of the Earth

Q1. Complete each sentence with the correct word.

(1) The Earth's surface is covered by water and _____.

(2) _____ is the top layer material covering the Earth's surface and is made of stones, gravels, sand, clay, air and water.

(3) _____ is small pieces of dead plants and animals in soil.

(4) A rock is made of one or more _____.

Q2. Choose the letter with the correct answer.

Which of the following is the correct explanation about soil?

A. All kinds of soil have the same colour.

B. The size of clay soil particles are larger than sandy soil.

C. Water can pass through clay soil more quickly than sandy soil.

D. When clay soil is wet, if feels sticky.

Q3. Answer the following questions.

Look at the picture on the right. What features can you find? Choose the correct answers from the list.

Desert	Ocean	River
Lake	Valley	Plain

Q4. What might happen to the plants if the soil is removed from where they grow?

Why does the Earth's surface looks different at different places?

Look at the picture showing the surface of the Earth. Around 80 percent of land in Papua New Guinea is covered by forest and therefore looks green.

How does the African continent look like? The middle part of the continent looks green and is covered by deep forest, while the northern part seems light brown and is covered by desert sands. The area of the desert is larger than Papua New Guinea.

Let's look at the Antarctic Continent located at the most southern part of the Earth. The continent is covered with ice and snow without growing plants, so it looks white.

Papua New Guinea is covered by forest.

The Earth's surface.

Chapter Test

10. The Earth

Q1

Complete each sentence with the correct word.

(1) The surface of the Earth is covered by _____ and land.

(2) A rock is made of one or more _____.

(3 Soil is mainly classified as loamy, sandy and _____ soil.

(4) Soil can be classified by its _____, size of particles and the substances it contains.

(5) Mountains, hills, valleys and flat places make up the _____.

Q2

Choose the letter with the correct answer.

(1) Which of the following is <u>not</u> a component of soil?

A. Humus

B. Rocks

C. Minerals

D. Plastic

(2) Which of the following is <u>not</u> provided by soil for plants?

A. Space to take root in

B. Water to survive

C. Humus to grow well

D. Sunlight to make food

(3) What kind of soil has the largest particle size?

A. Sand

B. Loam

C. Clay

D. All have the same particle size

(4) What do all rocks have in common? They have the;

A. Same size.

B. Same colour.

C. One or more minerals.

D. Same shape.

Q3

(1) A student observed a mixture of soil and water as shown on the right. What are the things floating on the water?

_____

(2) There are three main types of soil; sand, loam and clay. Sticky soil holds a lot of water. Which type of soil mostly makes sticky soil?

_____

Q4

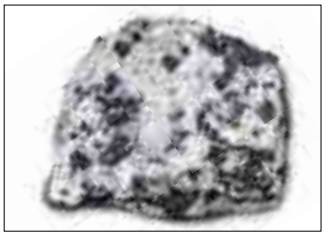
(1) How do animals help soil?

_____

_____

_____

(2) Look at the two rocks shown below.
Are Rock A and Rock B the same kind of rock? Write your answer with reasons.

	
Rock A	Rock B

_____

_____

Science Tool Box

1. How to use a Balance
2. How to use a Thermometer
3. How to use a Compass
4. How to draw a sketch

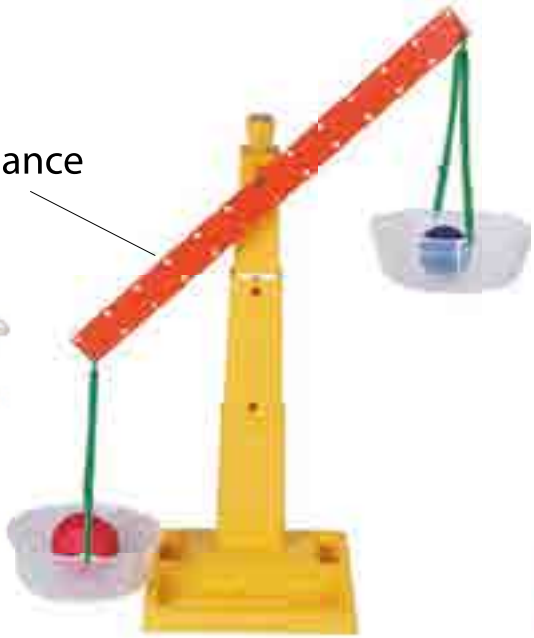
I would like to use the science tools in the lesson!

Let's check and learn how to use the science tools here.

Thermometer

Compass

Balance



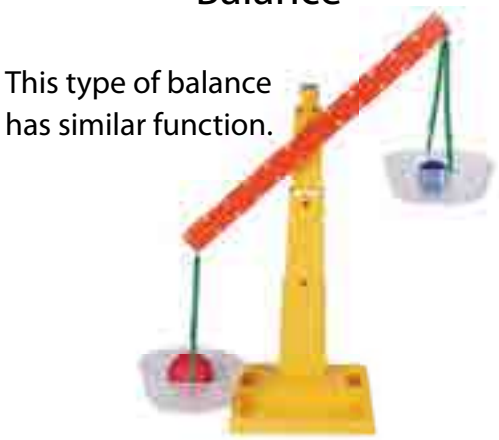
How to use a Balance

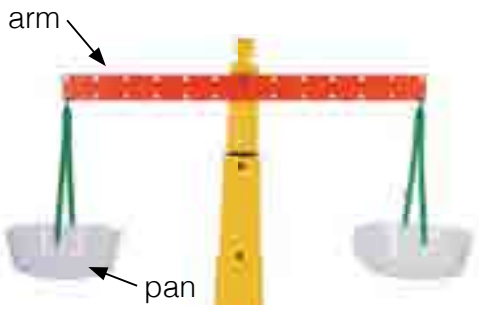
Balance

1. What is a balance?

A balance is an instrument that is used to compare weight. Weight is a property of matter in an object. A balance has two pans, on the left and right of the arm. To compare the weight of two objects, place an object on the left and another on the right pan. The arm tilts down to the heavier side. If two objects have equal weight, then the left and right pans are balanced.

This type of balance has similar function.





2. Comparing the weight of coins

STEP 1:

Check that the empty pans are balanced. If it needs to be adjusted, move the slider or adjuster until the pans are balanced.

STEP2:

Place a coin on the left pan and another coin on the right pan. When the arm tilts down to the right, then it means the coin on the right pan is heavier than the left side. If the left and right pans are balanced, the two coins have the same weight.

How to use a Thermometer

1. What is a thermometer?

A thermometer is an instrument we can use to measure temperature. A thermometer consists of a glass tube with marks on it. When the liquid in the glass tube gets heated, it expands and begins to rise up the tube. Temperature is measured in degree Celsius [°C].

2. Measuring temperature

STEP 1:

Place the bulb in the place where you want to measure the temperature. Make sure that there are no bright lights or direct sunlight shining on the bulb.

STEP2:

Wait for a few minutes until the liquid in the tube stops moving. Position your eyes at the same level with the top of the liquid in the tube.

STEP3:

Read the scale line that is closest to the top of the liquid. The thermometer as shown on the right shows 27 °C.

How to use a Compass

Compass

1. What is a compass?

A compass is an instrument you use for finding directions (North, South, East and West). It has a dial and a magnetic needle that always points to the north/south. This helps you to locate your position on a map and to set the direction you wish to travel.

2. Finding directions

STEP 1:

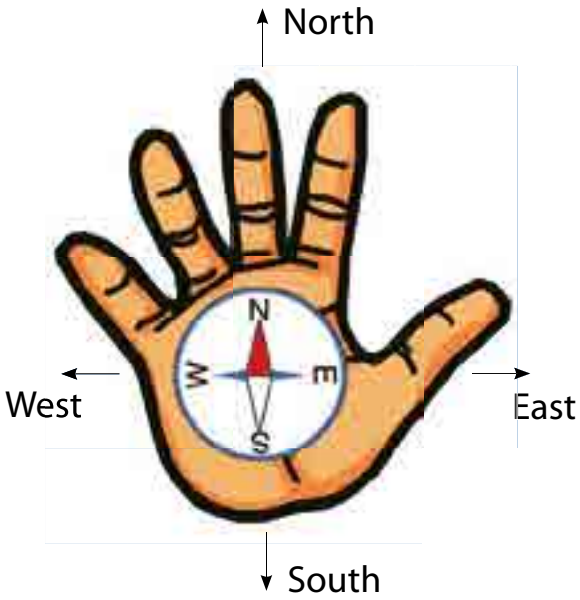
When you want to face North, place a compass flat on your palm and hold in front of your chest as shown in the picture on the right.

STEP2:

Turn your body until the magnetic needle comes to the sign of North on the dial. When the needle overlaps the North sign on the dial, you are facing North.

STEP3:

Find other directions when you are facing North. Your right side points to East and left side points to West and your back is facing the South when you are facing North.

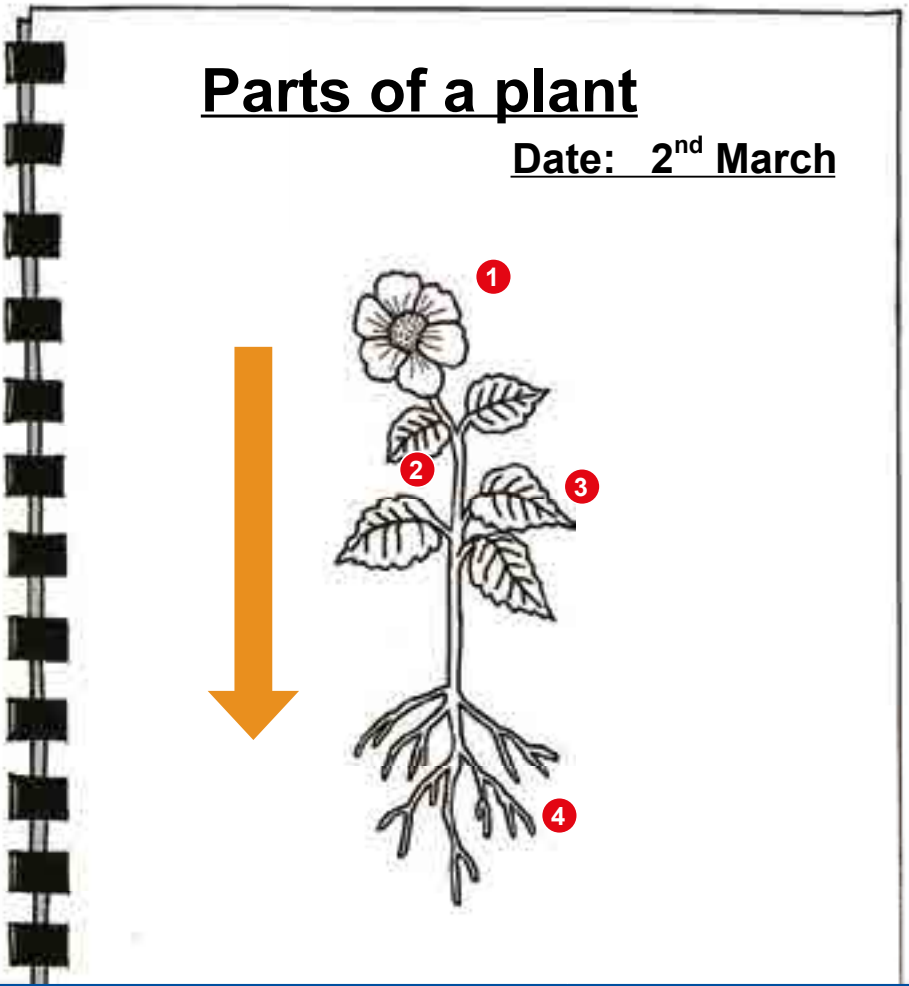


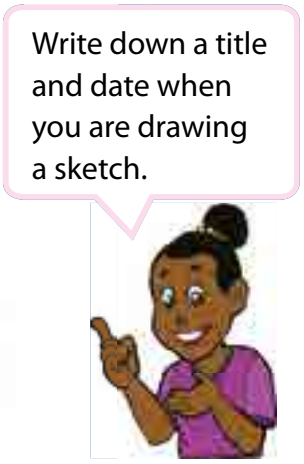
How to draw a sketch

Scientific sketch is NOT an artwork. The sketch requires precise drawing. If the plant has two leaves, the sketch should have two leaves only as they are.

The principle of sketch is “top to bottom” and “front side to back side”. For example, look at the sample below;

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





Answer of Exercise

Chapter 1, Topic 1, Page 20

Q1. (1) environment (2) living (3) natural (4) man-made (5) air

Q2.(1) D (2) C

Q3. Living things: trees, water lilies, grass,
Non-living things: Water, Air

Q4. (Example of the answer) A cloud is a non-living thing because it does not need food or water and does not reproduce its children.

Chapter 1, Topic 2, Page 26

Q1. (1) wetlands (2) ocean (3) trees (4) food (5) air

Q2. B

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

Q4. (Example of the answers) Some animals eat fruits bearing on trees, Some animals use tree for their home.

Chapter 2, Topic 1, Page 44

Q1. (1) Matter (2) Properties (3) Balance

Q2. (1) D (2) C

Q3. Object A

Q4. (Example of 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.

Chapter 2, Topic 2, Page 56

Q1. (1)space (2)millitres, litres (3)Shape (4)Different

Q2. (1) A (2) B

Q3. Plastic bottle cap

Q4. (Example of 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

Chapter 2, Topic 3, Page 62

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

Q2. (1) D (2)D

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

Q4. (Example of answer) Sand can be separated from the rice grain and pieces of wood by strainer so that he left with rice and pieces of wood, and then rice can be separated by using water so pieces of wood can float and rice will sink. So he can pour out the water slowly and collect all rice grains.

Chapter 3, Topic 1, Page 74

Q1. (1) Different (2) Sunlight (3) Stem (4) Flowers

Q2. (1) C (2)A

Q3. (1) (A) flower (B) leaves (C) stem (D) roots (2) Take in water and nutrients from soil,and hold the soil and keep plants upright.

Q4. Plants will have no water and nutrients taken from the roots and the plant would die

Chapter 3, Topic 2, Page 82

(1) parts (2) margin (3) taproot (4) stem (5) parallel

Q2. (1) C (2) D

Q3. (Examples of the answers) (1)Mango, guava, crotton, hibiscus, rain tree, rose, bougainvillea (2) Grass, corn, lily, bamboo, coconut, betelnut, oil palm

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.

Chapter 4, Topic 1, Page 104

Q1. (1) mammals (2) insect (3)amphibian (4)fins (5) protection

Q2. D

Q3. (1) A. Insects B. Amphibians C. Birds D. Reptiles E. Fish F. Mammals (2) A. Ear B. Eyes C. Nose D. Mouse E. Wings F. Legs

Q4. Legs, wings

Answer of Exercise

Chapter 5, Topic 1, Page 114

Q1. (1) Energy (2) Forms (3) Heat (4) Light

Q2. (1) C (2) D

Q3. Heat and electrical energy

Q4. (Example of the answer) An ambulance uses the siren to warn drivers and people to get out of the way. If there was no sound the other drivers wouldn't not know and not make way for the ambulance.

Chapter 6, Topic 1, Page 124

Q1. (1) Sun (2) energy (3) heat (4) Light (5) food

Q2. (1) C (2) B

Q3. (1) The sun looks smaller because it is very far away from the earth. (2) (Example of the answer) The Sun keeps animals warm. / Light from the Sun helps animals to see objects / The sunlight helps plants to grow. etc.

Q4. (Example of answer) There will be darkness everywhere, The earth will be so cold.

Chapter 6, Topic 2, Page 132

Q1. (1) Shadow (2) low (3) east (4) east (5) Night

Q2. (1) C (2) B

Q3. (1) The movement of the sun across the sky. (2) The shadow is made in the same direction as the sun.

Q4. The rotation or spin of the earth.

Chapter 7, Topic 1, Page 152

Q1. (1) Light (2) energy (3) shadow (4) Translucent (5) lens

Q2. (1) B

Q3.(1) Sun and torch (2) 1. By moving the object closer to the light source 2. By moving the light source closer to the object

Q4. (Example of answer) Because when light hits these objects the light is reflected off from these objects and travels straight to our eyes which enables us to see them.

Chapter 8, Topic 1, Page 170

Q1. (1)iron (2) South (3) South (4) repel

Q2. (1) C (2) B

Q3. B, E, H, J

Q4. (Example of answers) The earth is big magnet whose south pole is placed at the North (Arctic). North pole on a compass always attracted by South pole of magnet. Therefore, North pole of a compass always indicates to the North of the earth.

Chapter 9, Topic 1, Page 188

Q1. (1) speed (2) force (3) direction (4) shape

Q2. (1) D (2) A

Q3. The force applied is push

Q4. (Example of answer) The box Mary pushed across a smooth tile floor. Because on a smooth tile floor it has less friction.

Chapter 9, Topic 2, Page 198

Q1. (1) machine (2) lever (3) pulley (4) inclined plane

Q2. (1) B (2) C

Q3. (1) Pulley (2) It is used to lift objects such as containers and bigger objects.

Q4. lever

Chapter 10, Topic 1, Page 214

Q1. (1) land (2) soil (3) humus (4) minerals

Q2. (1) D

Q3. Mountain, River, Valley

Q4. (Example of answer) Plants are not able to keep upright without soil because soil supports plant's roots. / Plants would die without soil because plants are not able to use enough water to survive from soil.

Glossary

Amphibian is an animal whose body is covered with moist skin. 88

Axis in the Earth is an imaginary straight line that passes through the North pole and South pole of the Earth. 130

Balance is a tool to compare the weight of matters. 36

Bird is an animal that has feathers and wings. 88

Compass is an instrument you use for finding directions. 168

Direction is the path that an object takes. The direction tells us where the object is going. 184

Energy is the ability to do work. Energy can change and move things. ... 110

Environment is everything that makes up our surroundings. 12

Man-made environment is the environment that is made of man-made things. 14

Natural environment is the environment made of natural things. 14

Nonmagnetic object is an object that is not attracted by a magnet. 160

Fibrous root is a root that has many smaller roots that spread out in different directions. 76

Fish is an animal that lives in water and has scales and gills. 88

Force is a push or a pull. 176

Forest is a place with many trees that grow close together. 22

Friction is force that makes an object slow down and stop when two surfaces of objects are rubbed against each other. 180

Fulcrum is the point on which the lever turns or balances. 194

Gravity is the force that pulls objects toward Earth's centre. 176

Herbs are plants that have soft and green stems. 78

Humus is tiny bit of dead plants and animals in soil. 208

Inclined plane is a simple machine made up of a flat and slanted surface. 192

Insect is an animal that has 6 legs and hard outer covering. 88

Leaf is a part of plants made up of a leaf stalk, a leaf blade, and veins. 70

Glossary

Leaf blade is the main flat area of the leaf. 80

Leaf margin is shape of leaf edges. 80

Leaf vein is a tube that can help carry water and nutrients throughout the leaf. 80

Lever is a simple machine made up of arm and fulcrum. 194

Light is energy that we can see. 138

Living things are things that grow, change and breathe, can move by themselves and produce new living things. 16

Magnet is an object that attracts magnetic object. 158

Magnetic object is made of iron and attracts to a magnet. 160

Magnetic poles are the parts where a magnet attracts objects most strongly. All magnets have north and south pole. 162

Mammal is an animal that has fur or hair and breathe by lungs. 88

Man-made things are things made by people. 14

Matter is everything around us. 32

Mineral is a non-living thing found in nature such as gold, diamond and copper. 206

Mixture is something made of two or more kinds of matters. 58

Natural things are things that come from nature and not made by people. Plants, animals, soil, air and water. 14

Non-living things are things that do not grow, change, breathe and cannot produce new ones. 16

Nutrient is a material in the soil that living things need to grow 72

Object is a thing that we can see and touch. 41

Ocean is the vast body of salt water. 22

Opaque objects do not let any light travel through them. 142

Property is anything that we learn about a matter such as weight, size, colour, and texture. 34

Animals of PNG


Whale shark
Yellowfin tuna
Green tree python
Red-knobbed imperial pigeon
Rhinoceros beetle
Skipjack tuna
Coconut crab
Lacey scorpionfish
Map puffer
Bottlenose dolphin
Queen alexandra's birdwing
Clownfish
Saltwater crocodile
Dugong

continued

● Mammals ▲ Birds ■ Reptiles ◆ Amphibians
◉ Fish ★ Insects ◎ Others

Animals in Land and River


● Short-beaked echidna


● New Guinea quoll


● Sugar glider


● Chestnut tree mouse


▲ Fawn breasted bowerbird


▲ Papuan frogmouth


▲ Azure kingfisher


▲ Grey crow


■ Slender emo skink


■ Ground gecko


■ Papuan tree dragon


■ Slatey-grey snake


◆ Striped rocket frog


◆ Brown river tree frog


★ Longhorn beetle


★ Rainbow ant


★ New Guinea birdwing


★ Katydid


◎ New Guinea tarantula

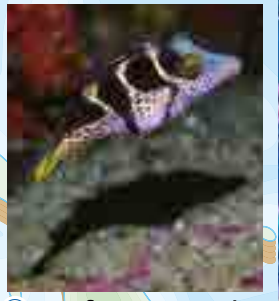

◎ Freshwater crab

Animals of PNG

Animals in Ocean

False killer whale

Leatherback turtle



Pacific crown toby

Purple anthias

Blue-girdled angelfish

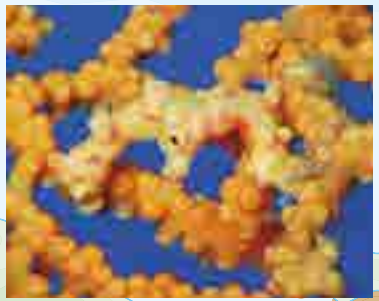
Teira batfish

Yellow and blueback fusilier

Grey reef shark

Manta ray

Blackfin barracuda



Denise's pygmy seahorse

Ornate ghost pipefish

Cuttlefish

Nudibranch

Painted spiny lobster

Squat shrimp

Giant clam

Cushion seastar

National Science Grade 3 Textbook Development Committee

The National Science Textbook was developed by Curriculum Development Division (CDD), Department of Education in partnership with Japan International Cooperation Agency (JICA) through the Project for Improving the Quality of Mathematics and Science Education (QUIS-ME Project). The following stakeholders have contributed to manage, write, validate and make quality assurance for developing quality Textbook and Teacher's Manual for students and teachers of Papua New Guinea.

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