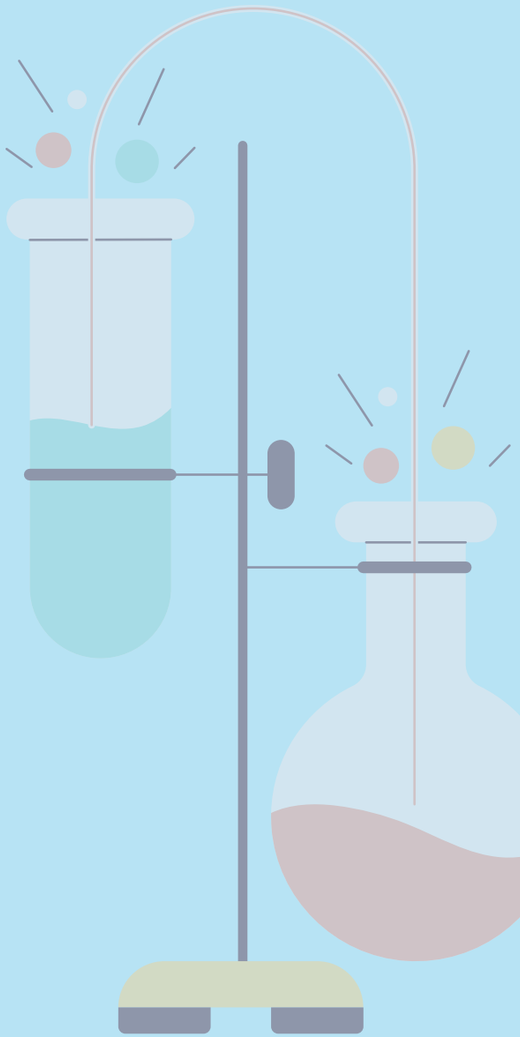

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விஞ்ஞானம் - முதலாம் தவணை
மொடியூல் 01,02 மற்றும் 03 (ஆ) - தரம் 6
SC06EC1E-2026/306/44,600

Science - 1st Term Module 01,02 and 03 (E) - Grade 06

Science

First Term

Module 01,02 and 03

Grade 06

Department of Science
Faculty of Science and Technology
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The National Anthem of Sri Lanka

Sri Lanka Matha
Apa Sri Lanka Namo Namo Namo Namo Matha
Sundara siri barinee, surendi athi sobamana Lanka
Dhanya dhanaya neka mal palaturu piri jaya bhoomiya ramya
Apa hata sepa siri setha sadana jeewanaye matha
Piliganu mena apa bhakthi pooja Namo Namo Matha
Apa Sri Lanka Namo Namo Namo Namo Matha
Oba we apa vidya
Obamaya apa sathya
Oba we apa shakthi
Apa hada thula bhakthi
Oba apa aloke
Apage anuprane
Oba apa jeevana we
Apa mukthiya oba we
Nava jeevana demine, nithina apa pubudukaran matha
Gnana veerya vadawamina regena yanu mana jaya bhoomi kara
Eka mavakage daru kela bevina
Yamu yamu vee nopama
Prema vada sema bheda durerada
Namo, Namo Matha
Apa Sri Lanka Namo Namo Namo Namo Matha

අධ්‍යාපන ප්‍රකාශන දෙපාර්තමේන්තුව විසින් සකස් කරන ලද වීඩියෝ ඊ තක්සලාව වෙබ් අඩවිය හා යූටියුබ් වැනලය මඟින් නැරඹිය හැකිය.
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අන්තර්ක්‍රියාකාරී පාඩම්, වීඩියෝ පාඩම්, ශ්‍රව්‍ය ඉගෙනුම් ආධාරක, ක්‍රියාකාරකම් පත්‍රිකා, මාර්ගගත ප්‍රශ්නාවලි,පෙළපොත, අධ්‍යාපනික විනෝදාත්මක වැඩසටහන්, මාර්ගගත පාඨමාලා ඇතුළු තවත් අධ්‍යාපනික වැඩසටහන් සඳහා පිවිසෙන්න.
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Year	Name of the Student who is using the book	Grade	Signature of the class teacher
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2027			
2028			
2029			

SCIENCE

1st Term

Module 01, 02 and 03

Grade 06

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Science -Grade 6

First Term:

Module 01 - Things Around Us

Module 02 - Wonders of the Living World

Module 03 - From the Universe to Our Home

First Print-2025

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Message from the Director General

The General Education Transformative Reform Effort in Sri Lanka aims to create a decisive pathway to meet the needs of every learner. The foundation of this reform lies in the modernization of curricula, teaching–learning methodologies, and assessment systems, with a strong emphasis on competency-based learning, critical thinking, creativity, 21st-century skills, technological orientation, and ethical citizenship.

The contribution of the Hon. Prime Minister; the Secretary to the Ministry of Education; Additional Secretaries; Subject Directors; the Commissioner General of Examinations and the staff; and the Commissioner General of the Educational Publications Department and the staff, who worked with exceptional dedication, has been immense in ensuring the quality of the curricula and related learning materials proposed for implementation from the year 2026 for Grades 1 and 6. These materials have been developed by the National Institute of Education through a collaborative dialogue with educationists, interdisciplinary experts, teachers, and various stakeholders.

I also gratefully acknowledge the exceptional commitment of the Council and the Academic Affairs Board of the National Institute of Education during this initiative. The entire staff of the National Institute of Education, who have contributed immensely in accomplishing this task, deserve the respect of the nation.

Prof. Manjula Vithanapathirana (PhD)
Director General
National Institute of Education
11.08.2025

Message from the Commissioner General of Educational Publications

The world today is progressing at an exceptional pace, driven by innovation and transformation. In parallel, it is the paramount responsibility of everyone involved in the field of education to equip schoolchildren with the skills necessary to face the challenges of the modern world. Accordingly, it must be noted with pride that the opportunity to introduce the module-based learning approach aligned with the new curriculum to be implemented from the year 2026 is a significant achievement.

These specially designed learning aids for each subject aim to strengthen essential skills such as critical thinking, creative problem-solving for complex issues, analyzing information from multiple perspectives, and making logical decisions. I believe these resources will serve as a strong foundation for each subject.

I kindly request all of you to use these learning aids as a guiding light to help realize the noble dreams of a generation of students enriched with wisdom and virtue. I also extend my heartfelt gratitude to everyone who contributed immensely to the excellent task of compiling the modules and activity books.

D. A. Subhashini Dematagoda
Commissioner General of Educational Publications
Educational Publications Department,
11.08.2025

Foreword

Broad learning areas identified with regard to the total school curriculum reflect the ability of a nation to overcome the challenges emerging for sustainable development in a continuously changing country and a world. Besides, broad learning areas need to be identified in synchrony with the demands changing from time to time. This not only modernizes the subjects in the prevailing school curriculum but also introduces new subjects to the school curriculum. It is clear that learning teaching process too should develop timely corresponding to these changes taking place. As a result of this, under the new curriculum that will be implemented with effect from 2026, learning - based modules have been introduced for every subject from grade 6 upwards. For the primary grades and the junior secondary grades, it has been proposed to introduce the new curriculum as follows: for grades 1 and 6 in 2027, grades 2 and 7 in 2028, grades 3 and 8 in 2029, grades 4 and 9 in 2029 and grades 5 in 2030. Modules containing new learning methodologies have been prepared from the junior secondary level and the teacher is expected to give guidance for the leaner. The modules have also created the environment essential for self - learning. It is our belief that these modules are much helpful to develop strongly the knowledge on the concepts required for the students and their abilities and interests while directing them to apply the acquired knowledge to pragmatic situations. The learning transferred by these modules will also help strengthen the literacy, interpersonal relations and values necessary for the 21st century.

Every module indicates the guide to use modern technology. They also will provide students assessment tools needed to evaluate transparently the performance and educational objections achieved by them. Always, every module is very important to give guidance for a real learning applying new talents and knowhow to applied situations. I also wish to remind that the service rendered by the teachers, in- service advisers, directors as well as the contribution given by the government and private institutions through respective fields helped raise the quality of these modules. Further, I state that the suggestions made through the practical experience gained in the use of these modules are momentous and I respectfully invite you all.

K. Rajith Pathmasiri
Deputy Director General
Faculty of Science and Technology
08.08.2025

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Introduction

The 2026 Science Curriculum marks a major shift towards a student-centered approach, focusing on curiosity, critical thinking, creativity and real-world connections. This reformed curriculum offers authentic learning experiences that encourage students to explore scientific concepts and principles through inquiry and hands-on activities. Subject content is organized into following themes Matter and Energy; Health Nutrition and Well-being; Life and Life Processes; Universe the Earth and Environment; Science Technology and Society. Each module links science to everyday life and global challenges. Given assessment guidelines support meaningful learning and helps students to develop as informed problem-solvers prepared for the future.

Module - 1: Things Around Us

This module aims to introduce the physical states of matter and their characteristics. It also provides knowledge to identify the specific physical properties of solid matter and to study how solid matter is used in day-to-day activities. The activities included in this module guide learners towards active learning with peers while developing the basic concepts of "Things Around Us", a topic to closely related to everyday life. Studying this module will open opportunities to create innovations by using the things around us and understanding their properties.

Module - 2: Wonders of the Living World

This module provides opportunities to identify the plant and animal world, to understand the diversity of the living world and to enjoy its wonders. Further, it is ensured that the students who complete this module will involve and care for the environment as expected from the citizens of today. Another special feature of this module is obtaining the capability of learning with patience and immense courage, learning cooperatively with peers to accomplish the learning outcomes expected from students.

Module - 3: From the Universe to Our Home

This module on the theme Universe, the Earth and Environment provokes your natural curiosity and provides you a broad picture of our Earth by referring them to the beauty of the Universe. You will be starting the journey from the Universe and then gradually moving to the planets of the solar system. This turns you to an Earth lover through understanding about its amazing characteristics. The study on science of natural resources on the Earth will inspire you as a patriotic learner with a sound basis of sustainable living style in the future. The learning of weather and climate and its relationship with natural disasters will lead your inquiry mind to promote scientific thinking, while providing you more authentic learning opportunities for wise decision-making in your day-to-day life.

Instructions to the Learner

Welcome to the Science Grade 6 Essential Learning Modules

The 21st century learners like you are global citizens who think creatively and critically, and also communicate and collaborate with others effectively while enjoying a quality life. You are capable of digital literacy and always put your efforts on continuous learning.

These modules are designed to provide you with interesting and meaningful opportunities for guided and independent learning at your own pace and time. You will be guided to process the content of the module while being an active learner who works in real world scenarios.

General Guidelines

- Read the instructions carefully before doing each task.
- Use eco-friendly or reusable materials for activities as much as possible.
- Follow safety and health guidelines when doing each activity.
- Observe honesty and integrity in doing the tasks and checking your answers.
- Do not write anything in the module.
- These modules contain helpful tips or strategies with corresponding icons that will help you in learning as given in the respective page.

Content

Reading Keys

 **Pre - activity/ pre - test**

 **Individual Activity**

 **Group Activity**

 **Home Assignment**

 **Assessment**

 **Exercise**

 **Post - test**

 **Extra Knowledge**

 **Blended Learning**

 **Safety Alert**

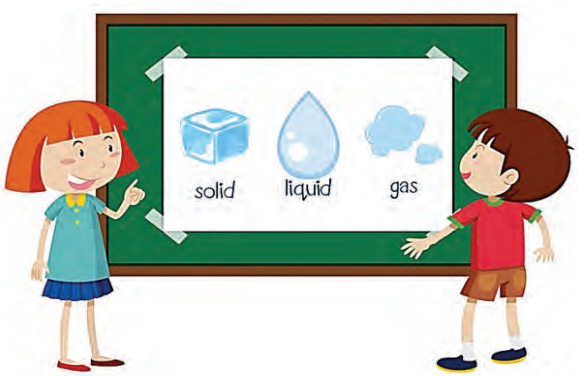
Module 01

Things Around Us

Module 01
Things Around Us

By studying the module on "Things Around Us", you will be able to,

- identify and express things in the environment as matter and energy with examples.
- list three physical states of matter.
- classify substances in the environment into three physical states of matter with examples.
- differentiate the characteristics of three physical states of matter through simple activities.
- identify and express specific physical properties of solid matter through simple activities.
- present the applications of specific physical properties of solid matter in day-to-day life.



Let us identify the physical states of matter

1.1

Pre-activity 1.1.1

Let us go for a walk in our environment

Let us go for a walk on a sunny day to observe our environment. You will observe many things such as trees, flowers and the sounds of birds. Also, you will feel the warmth of the sun and the breeze. Have you ever wondered how to classify what you found outside? There are several ways to classify them.

Write three examples each of solids, liquids and gases in the boxes provided below, based on the things you observed during the nature observation visit.

Solid	Liquid	Gas
1.	1.	1. .....
2.	2.	2. .....
3.	3.	3. .....

Did you observe any other things which do not belong to the above groups? If so, write down their names in the following box.

Important Facts

- Things that you have observed can be classified mainly into solids, liquids and gases, which are the states of matter.
- Also, there are things that do not belong to these three groups such as heat, light and sound. Those are examples for energy.

Let us further examine solids, liquids and gases through the activities.

Activity 1.1.1

Let us find what is inside the bottle

THINGS YOU NEED

- Five transparent glass or plastic bottles with caps
- Water
- Pebbles or marbles



HOW TO DO

Step - 1

Take five bottles and label them as A, B, C, D and E.

Step - 2

Add the things into each bottle as listed below and close the cap.

Bottle A : Water up to the half of the bottle
Bottle B : Few pebbles or marbles
Bottle C : Water up to the half of the bottle and a few pebbles or marbles
Bottle D : Water to fill the bottle fully
Bottle E : None

- Identify which solid, liquid and gas is/ are in each bottle.
- Place a tick (✓) for the things inside the bottle and a cross (X) for those that are not in the bottle.
- Compare the table which you have filled with the findings of your friends.
- Discuss with your teacher to confirm the accuracy of your answers.

	Solid	Liquid	Gas
Bottle A			
Bottle B			
Bottle C			
Bottle D			
Bottle E			

Here you can see a picture of a volcanic eruption. Try to categorize the emissions as solid, liquid and gas.

You have learned that the things around us can be classified as solids, liquids or gases. However, can we easily classify substances like ice cream, jelly or foam into a single, definite physical state?

It is not always easy, because some manmade and natural substances are made up of two or more materials that exist in different physical states. In addition, changes in environmental conditions, such as temperature, can also affect the state of a substance.

Exercise 1.1.1

Let us categorize things in your kitchen as solids, liquids and gases

You have learned how to categorize things as solid, liquid and gas in the Activity 1.1.1. Now identify the solids, liquids and gases in your kitchen and write three examples of each.

Solid	Liquid	Gas
e.g. Spoon	e.g. Water	e.g. Oxygen
1.	1.	1. .....
2.	2.	2. .....
3.	3.	3. .....

State three things in the kitchen that cannot be categorized into solids, liquids or gases.

.....

Do the following assessment with the support of your friend (peer assessment) to examine the accuracy of the above exercise.

How accurately have I answered the questions?
Exercise : Let us categorize the materials in your kitchen as solids, liquids and gases

Colour the matching number of star marks using the following criteria.
Out of the given answers,

all three are correct. (★ ★ ★)
only two are correct. (★ ★ ☆)
only one is correct. (★ ☆ ☆)

Examples for solids	(☆ ☆ ☆)
Examples for liquids	(☆ ☆ ☆)
Examples for gases	(☆ ☆ ☆)
Examples for those that cannot be classified under solids, liquids or gases	(☆ ☆ ☆)

Now let us engage in the following activities to identify the characteristics of solids, liquids and gases.

Let us compare the characteristics of solids, liquids and gases

1.2

Activity 1.2.1

Let us find out whether solids have mass

THINGS YOU NEED

- A household balance
- Any solid object you can find easily (stone, a piece of wood, etc.)

HOW TO DO

STEP - 1

Adjust the reading to zero, if the reading of the balance is not zero.

STEP - 2

Now place the solid object you brought on the balance and record the reading.

Complete the following table using your readings and answer the questions.

Instance	Reading/ g
Before placing the solid object on the household balance	
After placing the solid object on the household balance	

1. What could be the reason for the change in reading of the household balance when the solid object you brought was placed on it?

.....

.....

2. Discuss the results that you have obtained with your group. Did all the solid objects used by the group members in this activity cause a change in the reading on the household balance?

.....

.....

3. According to the observations, identify a common characteristic of all the solid substances selected for this activity and write it down.

.....

Home Assignment 1.2.1

Let us find out whether daily used solid materials have mass

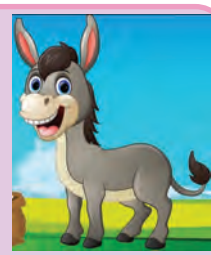
Observe the labels of several household items brought from the market. Note the masses indicated on them. Then complete the following table.

Substance	Mass (mg/ g/ kg)

Important Facts

- The amount of matter in an object is referred to as its mass.
- kg (kilogram), g (gram) and mg (milligram) are some of the units used to measure the mass.
- The international unit of measuring the mass is kilogram (kg).

Let us read a story : Lazy Donkey



Once upon a time in a country, there was a trader selling salt. A donkey helped the trader to carry salt. This donkey was very lazy.

One day when the donkey was carrying bags of salt on its back, it slipped its leg and fell into the river. Salt dissolved in water, the donkey felt lighter. The lazy donkey thought that by falling into the river intentionally, it would make the journey easier. As the donkey thought, it fell into the river. The trader understood that the donkey tumbles intentionally.

One day the trader loaded the donkey with bags of cotton instead of salt. That day also the donkey fell into the river purposely. The donkey felt very uneasy when cotton was soaked with water and the journey became difficult. That day the donkey understood that laziness is not good and the duty one does should be done correctly.

Think of the reason why the donkey in this story felt easy when salt dissolved and felt uneasy when cotton was soaked with water.

Activity 1.2.2

Let us find out whether liquids have mass

THINGS YOU NEED

- A household balance
- A graduated cup or a beaker
- Any suitable liquid you can find (water, coconut oil, fresh milk etc.)

HOW TO DO

STEP - 1

Adjust the reading to zero, if the reading of the household balance is not zero. Place the empty beaker or the graduated cup on the household balance and record the reading.

STEP - 2

Add 100 mL of the liquid you brought into the beaker/ graduated cup and record the reading.

Complete the following table using your readings and answer the questions.

Instance	Reading/ g
1. After placing the empty graduated cup/ beaker on the household balance	
2. After adding the selected liquid into the graduated cup/ beaker	

1. What is the difference between the readings you obtained in instances (1) and (2) above?

.....

2. What can be the reason for the difference in these two readings?

.....

.....

3. Discuss the results that you have obtained with your group. Did all the liquids used by the group members in this activity cause a change in the reading on the household balance?

.....

4. State a characteristic common to all the liquids identified in this activity.

.....

For Extra Knowledge

mercury

The symbol Hg for mercury is known to have come from its Latin name, hydrargyrum, which means "liquid silver". Mercury is a metal that exists as a liquid at room temperature. While the mass of one millilitre of water 1 g, the mass of one millilitre of mercury is approximately 13.6 times greater.

It is very toxic. It can enter the body through an open wound or by inhalation or ingestion, if it is used carelessly.

Activity 1.2.3

Let us find out whether gases have mass

THINGS YOU NEED

- A household balance
- An inflated volleyball or any other suitable inflated ball

HOW TO DO

STEP - 1

Adjust the reading to zero, if the reading of the household balance is not zero. Place an inflated volleyball on the balance and record the reading.

STEP - 2

Deflate the volleyball and place it on the balance and record the reading.

Complete the following table using your readings and answer the questions.

Instance	Reading/ g
1. After placing the inflated volleyball on the balance	
2. After placing the deflated volleyball on the balance	

1. What is the difference between the readings you obtained in instances (1) and (2) above ?

   .....

2. What can be the reason for the difference in these two readings?

   .....

3. State a characteristic common to the gases identified in this activity.

   .....

You may have noticed that a new gas cylinder used for cooking is difficult to lift or move. But after using it for a fairly long time for cooking, it can easily be lifted or moved. The reason for this is emptying of the liquid petroleum gas (LP Gas) contained in it. (Domestic gas cylinders contain a compressed gas mixture. Therefore, it is in the liquid state while inside the cylinder).

If you have an internet connection, you can further explore whether gases have mass by watching the video linked below, with the assistance of an adult.

https://drive.google.com/drive/folders/1c7H5qAZREK5vnwVdjJvRvIGLvVAQ1yTd?usp=drive_link

Important Facts

- Having mass is a common characteristic of the solids, liquids and gases.

Let us find another characteristic of solids, liquids and gases.

Activity 1.2.4

Let us find out whether solids and liquids occupy space

THINGS YOU NEED


A basin


Two plastic bottles (500 mL and 1 L)


A hacksaw blade


Measuring cylinder


Cotton thread


Two solid objects with different sizes (stones)


Funnel

HOW TO DO

STEP - 1

Take a large plastic bottle (about 1 L) and a small plastic bottle (about 500 mL). Fill the large bottle completely with water.

STEP - 2

Place the small bottle in the basin. Using a funnel, pour the water in the large bottle into the small bottle without spilling until it is completely filled with water.

1. What happened when water remaining in the large bottle poured into the small bottle?

   .....

2. Was there enough space in the small bottle to pour the remaining water in the large bottle?

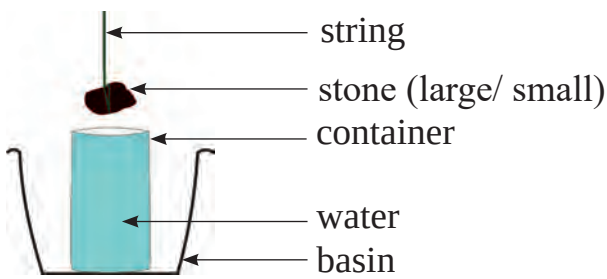
   .....

3. Since the water you used here is a liquid, what can you say about liquids based on the observations you made in this activity?

   .....

STEP - 3

Do the following activity using the container made by cutting the large bottle horizontally exactly at its middle with the hacksaw blade or any other suitable container.



Pour water until the container gets fully filled with water. Then dip the larger stone tied to a piece of string completely into water as shown in the diagram.

Repeat the third step for the small stone also.

4. Write your observation when a large stone and a small stone are separately dipped in water completely.

.....

.....

.....

5. Propose a method to measure the volume of water displaced in each instance.

.....

.....

6. Using the method you proposed above, record the volumes of water displaced from the container in the following table when the small stone and the large stone were dipped in water.

Object dipped in water	Volume of water displaced/ mL
Small stone	
Large stone	

7. Which stone displaces a greater volume of water when the stone sinks?

.....

8. What can you say about solids based on the observations you made in this activity?

.....

.....

.....

Now measure the volume of an object floating on water by using the knowledge you have gained from the previous activity.

Dear students, you will be given marks for the following group activity.

Group Assessment 1.2.1
Let us find the volume of an object floating on water

1. Select a suitable object which floats on water, to measure the volume.
2. Discuss with your group members a method to measure the volume of a floating object based on the knowledge you have gained from the activity 1.2.4.
3. Draw the diagrams of the method that you would use to measure the volume of the floating object.
4. Find the volume of the floating object.

Activity 1.2.5
Let us find out whether gases occupy space

THINGS YOU NEED

- A transparent bottle
- A basin of water

HOW TO DO

STEP - 1
Open the cap and immerse the bottle (upside down) in the basin of water as shown in Figure 1.2.1.


Figure 1.2.1

STEP - 2
Tilt the bottle a little as shown in Figure 1.2.2 and let the water flow in.


Figure 1.2.2

Based on your observations, answer these questions.

1. In step one, was the bottle completely filled with water when it was immersed in water? Explain reasons for your answer.

.....

.....

.....

2. What are the observations in step two? Explain the reasons for your observations.

.....

.....

.....

If you have an internet connection, you can further explore whether gases occupy space, by watching the video linked below, with the assistance of an adult.

https://drive.google.com/drive/folders/10C_JSs0se7czA6v02NUXscylHuAkFpbK?usp=drive_link

Important Facts

- Solids, liquids and gases have mass and occupy space.
- Things that occupy space and have mass are known as matter.
- Those that do not occupy space and have no mass, such as light, sound and heat are classified as energy.

Activity 1.2.6

Let us examine whether gases have a definite volume

THINGS YOU NEED

- Two transparent containers (two gas jars/ two glasses)
- A joss stick
- A piece of cardboard

HOW TO DO

STEP - 1

Light the joss stick and let its smoke enter into an inverted glass. Then close the glass by using a piece of cardboard.

STEP - 2

Take another glass and place it as shown in Figure 1.2.3. Take off the piece of cardboard slowly.

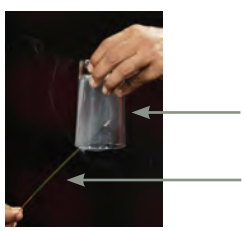


Figure 1.2.3

1. Write down the observation that you have made in this experiment.

   .....
   .....

2. State the reason for the observation you made.

   .....
   .....

Gases occupy space and have volume. You have observed that gas spreads throughout the container it occupies. Therefore, gases do not have a definite volume, since a gas occupies the volume of the container it is in.

Although a gas does not have a definite volume, under normal environmental conditions, it can be collected in a container, and its volume can be measured. You will experience this in the following activity.

Let us investigate how breath volume is measured and how it is important to our lives by the following activity.

Activity 1.2.7

Let us determine the breath volume of an individual

THINGS YOU NEED

- A large thick clear plastic bottle (1.5 L)
- A large tub/ deep bowl
- A measuring cup or a graduated cylinder
- Paper strip or masking tape
- Adhesive tape (cellotape)
- A pair of scissors
- A clean bendy saline tube or any other suitable tube
- Coloured water (coloured with food colourings)
- A piece of cardboard
- A pen

Figure 1.2.4

HOW TO DO

- Stick a paper strip or masking tape vertically on the outer surface of the bottle.
- Add 100 mL of water to the plastic bottle by using a measuring cup or a graduated cylinder. Mark the water level on the masking tape pasted on the plastic bottle.

- Calibrate the bottle by repeating this and mark every increment on the tape as 200 mL, 300 mL, 400 mL and 500 mL at least up to 1500 mL.
- Paste an adhesive tape on the graduated masking tape to protect it from soaking.
- Fill the basin with coloured water. Fill the plastic bottle right to the top with coloured water.
- Place a piece of cardboard over the top of the bottle to prevent water from spilling out when you turn it upside down.
- Turn the bottle upside down. Place the top of the bottle under water in the basin and remove the piece of cardboard.
- Insert one end of the tube into the bottle.
- Take a deep breath in and breathe out air through the tube into the bottle (Figure 1.2.4).
- Measure the volume of air your lungs can release in a single breath using the graduated masking tape in the bottle. Repeat this and measure the volume of breath of all group members.
  (When blowing into the same tube, follow sanitary practices)

1. Record the data obtained by your group in the following table.

Student's name	Breath volume/ mL	Student's name	Breath volume/ mL
1.		4.	
2.		5.	
3.		6.	

2. Discuss with your teacher the reasons for the variation of breath volume of the members of your group.

Fill in the following self assessment checklist to identify how successfully you have engaged with the activity.

How successfully have I engaged with the activity?
Activity: Let us determine the breath volume of an individual

Draw the appropriate face in front of each statement.

Strongly agree Fairly agree Do not agree

- I measured my breath volume by following the steps given in the activity. ☐
- I took necessary actions when problems arose during the activity. ☐
- I collaborated with other group members while doing the activity. ☐
- I identified the factors affecting the breath volume. ☐

For Extra Knowledge

The animal with the largest lungs in the world is the blue whale. In total, its lungs have a combined capacity of over 5,000 litres of air.

Important Facts

- ♦ Space occupied by an object is called its volume.
- ♦ Solids, liquids, as well as gases occupy a volume. The volume of solids and liquids is definite. However, the volume of a gas is not definite.
- ♦ Many units are used to measure the volume. However, the litre and millilitre are the most commonly used units.
  (symbol of litre - L, symbol of millilitre - mL)

Activity 1.2.8

Let us find out whether solids have a definite shape

THINGS YOU NEED

- Suitable solid objects such as a coin, a die and a pencil

HOW TO DO

Step - 1

Take suitable solid objects such as a coin, a die and a pencil and observe their shapes.

1. The coin, die and pencil used for this experiment are solid substances. What can you say about the shape of solids by your observations?

.....

Activity 1.2.9

Let us find out whether liquids have a definite shape

THINGS YOU NEED

- A measuring cylinder or a measuring cup
- Three transparent containers of different shapes
- Coloured water

HOW TO DO

Step - 1

Label the three transparent containers of different shapes brought by you as A, B and C.

Step - 2
Using a measuring cylinder or a suitable measuring equipment, pour a definite volume of coloured water into container A and draw the shape of the water in the box A below.

Step - 3
Then pour the coloured water in container A into containers B and C, respectively, and draw the shape taken by the liquid in each instance in the boxes B and C below.

A	B	C

2. According to your observations, what can you say about the shape of the liquids?

.....

Activity 1.2.10

Let us find out whether gases have a definite shape

THINGS YOU NEED

- Balloons of different shapes

HOW TO DO

Step - 1
Blow the balloons that you have brought and observe the shapes of them.

1. What is the substance in the inflated balloon? Name the physical state of it.

.....

2. What can you say about the shape of the matter filled in the balloon?

.....

Important Facts

- Solids have a definite shape. Liquids and gases do not have a definite shape; they occupy the shape of the container they are in.

This is a photo of a birthday party. You can get an idea of how the shape and the volume of matter change depending on its physical state to beautify various moments in life.

Exercise 1.2.1

Let us compare the characteristics of solids, liquids and gases

Indicate the characteristics of matter existing in solid, liquid and gaseous states comparatively in the following table.

Type of matter	Shape	Volume
Solid	has a definite shape	.....
Liquid	.....	has a definite volume
Gas	no definite shape	.....




Let us identify specific physical properties of solid matter

1.3

This time, the New Year celebration was held on a grand scale with the participation of all the villagers. Cracking the lucky pot, bursting balloon, climbing the slippery pole and selecting the New Year prince and princess (Avurudu kumara and kumari) were some of the events that attracted many.

Though several children participated in the lucky pot cracking competition, it was Daham who won it. With the blow he hurled, the pot smashed into pieces.

The balloon bursting event, held with the participation of children below 12 year of age, drew attention of many and Abhirami became victorious in it. By that time, the balloons of other contenders were blown to various sizes.

Rizwan was curious as he watched the next event, climbing the slippery pole. He wondered why the competitors kept falling before reaching the flag at the top, even though they tried hard.

The last item of the new year festival was the contest for selecting the "Avurudu kumara and kumari". Christina and Raghavan became the winners as Avurudu kumari and Avurudu kumara. Their victory was acclaimed by decorating them with golden coloured shiny crowns.

Discuss with your teacher the instances where specific physical properties of solid matter are applied in the above events.

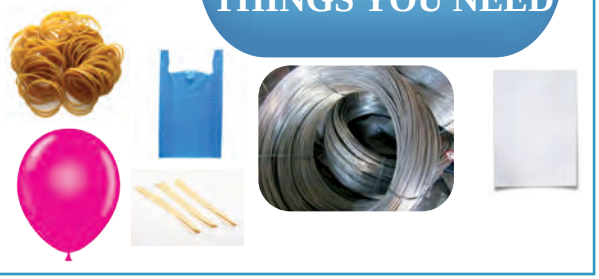
Let us inquire into the specific physical properties of solid matter by engaging in the following activities.

Activity 1.3.1

Let us identify the materials which are elastic

THINGS YOU NEED

- Rubber bands
- A piece of polythene
- A metal wire (bucket wire)
- A strip of paper
- A balloon
- A piece of elastic



HOW TO DO

STEP - 1

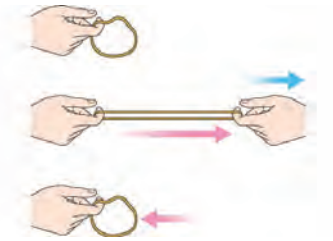
Pull each material to opposite sides with your hands.

STEP - 2

Record your observations in the table below.

Material	Does it change the shape when a force is applied?	Does it regain original position when the force is removed?
Rubber band	yes	yes
Piece of polythene		
Metal wire		
Paper strip		
Balloon		
A piece of elastic		

You have observed that some solid materials change their shape when a force is applied and return to their original position when the force is removed. This property of solids is known as **elasticity.**



Activity 1.3.2

Let us identify the materials which are brittle

THINGS YOU NEED

- A piece of chalk
- A piece of charcoal
- A piece of brick
- An eraser
- An iron nail
- A hammer
- A wooden board

HOW TO DO

STEP - 1

Give a blow to each of the materials with the hammer. Hammering should be done safely and it is better if the material is placed on a wooden board.

STEP - 2

Record your observations in the table below.

Material	Whether it breaks or crushes into pieces
Chalk	yes
Charcoal	
Piece of brick	
Eraser	
Iron nail	

Did you observe that some substances break or crush easily into pieces when a force is applied? This property of the solid is known as **brittleness.**

Activity 1.3.3

Let us identify the materials which are lustrous

THINGS YOU NEED

- An aluminium sheet
- An iron nail
- A coin
- A piece of wood
- An eraser
- A sandpaper with moderate roughness

HOW TO DO

STEP - 1

Rub the surface of each solid material with a sandpaper.

STEP - 2

Record your observations in the table below.

Material	Does the surface turn shiny?
Aluminium sheet	yes
Iron nail	
Coin	
Piece of wood	
Eraser	

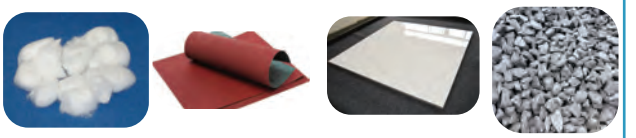
You have observed that some solids have a shiny appearance on their surfaces. This property of a solid is known as **lustre.**

Activity 1.3.4

Let us identify the materials with different texture

THINGS YOU NEED

- Cotton wool
- Sandpaper
- A piece of tile
- Gravel



HOW TO DO

STEP - 1

Touch the materials with your hand and observe how you feel.

STEP - 2

Record your observations in the table below.

Material	Is the material rough or smooth ?
Cotton wool	smooth
Sandpaper	
Both sides of a piece of tile	
Gravel	

You would have observed that the smooth or rough nature of various solid materials differs from one another. This nature of solids is called **texture.**

You have now learned some specific physical properties of solid matter. Let us investigate the instances where those specific physical properties are applied in day-to-day life.

Dear students, marks will be given to the following individual activity.

Individual Assessment 1.3.1

Let us investigate the instances in which specific physical properties of solid matter are used in day-to-day life

Identify instances where specific physical properties of solid matter are used. Present ten such applications creatively using a poster on an A3 paper or any other suitable paper, following the facts given below.

- Material
- Specific physical property
- Application

Example:

- Material - rubber
- Specific physical property- Elasticity
- Application - soother of the feeding bottles

Soother

If you have an internet connection, you can engage in more activities related to this lesson through the link given below, with the assistance of an adult.

https://www.e-thaksalawa.moe.gov.lk/moodle/course/view.php?id=3

By now, you have learned the physical states of matter, compared their characteristics, identified specific physical properties of solid matter and their uses in day-to-day life. Now engage in the following activity using the knowledge you have gained.

Dear students, marks will be given to the following group activity.

Group Assessment 1.3.1

Let us make a toy car by using the things around us

Materials required:

- A plastic bottle
- Five straws
- Four bottle lids equal in size
- Adhesive tape
- Two ekels or spoke wires (about 5 cm)
- Coloured papers
- A balloon
- Two rubber bands
- A piece of cardboard
- A pair of scissors

(You can use alternative materials instead of the materials given above.)

Method :

1. Sketch the plan of the toy car with measurements which you are going to make as shown in the diagram by using the above materials.
2. (i) What are the materials used to make the different parts of the toy car?
   (ii) While selecting the materials, what characteristics related to their physical states and the specific physical properties of solid substances are considered?
3. Make the toy car using the materials that you have obtained.
4. Select the winner by conducting a car race by using the toy cars made by all of you.

Note :

You have to submit the following to the teacher for the evaluation of this activity.

- Sketch of the toy car with measurements
- List prepared in the second step of the method
- Toy car made by the group

Exercise 1.3.1

Let us go on a pleasure trip to a farm

Given below is a note recorded by Shehan after his return from his journey to see his uncle's farm during the school vacation. Read it and answer the questions.

A pleasure trip to a farm

On a Saturday, I went with my family members to see my uncle's farm situated in a hilly area. That was a bright and sunny day. The moment we entered the farm, a fowl in the poultry yard crowed "cook-a-doodle-doo". That crowing sound gave us a feeling of being invited to the farm. Our uncle who was putting the milk taken from dairy cows early morning into large shiny metal containers was very much pleased to see us all.

Uncle's younger son Harshana who was plucking mangoes from a huge mango tree at the end of the farm with his catapult, came running to me with some mangoes as soon as he saw me. Later, uncle stopped his work and took all of us in our family with Harshana round the farm to see all the sites in it. He told and taught us many things. Of the things we saw, what aroused my interest most was the biogas unit which produces biogas using the dung of the animals in the farm.

When we were finishing our journey round the farm, aunt offered us glasses of fruit juice. When we were sipping them in the shade of the mango trees, Harshana dropped a glass kept on the bench by mistake which then fell on the ground and broke into pieces. By the time we finished our drink our tiredness was gone and the sun has risen to the top. As it was not possible to play outdoor under intense heat, we decided to play carrom. Harshana brought the carrom board, talcum powder and flick discs. We all played carrom happily and the trip was an indelible souvenir in my life.

1. Out of the things mentioned in this note, write two examples each for matter and energy.

   Matter - 1. ..... 2. .....
   Energy - 1. ..... 2. .....

2. Write one example for each of the three states of matter (solid, liquid and gas) from the given note.

   Solid - .....
   Liquid - .....
   Gas - .....

3. Select from the note and write examples for the states of matter with the following characteristics.

   Has a definite shape and a volume
   .....

   No definite shape but has a definite volume
   .....

   Does not have a definite shape or a definite volume
   .....

4. Select from the note examples for each of the following characteristics.

   Elasticity - .....
   Brittleness - .....
   Lustre - .....
   Texture - .....

5. Write the reason for using talcum powder on the carrom board when playing carrom.

   .....
   .....
   .....

Module 02

Wonders of the Living World

Module 02
Wonders of the Living World

After studying this module you will be able to:

- List characteristics of life.
- Distinguish living from non-living based on characteristics of life.
- List characteristics of plants.
- List characteristics of animals.
- Identify the diversity of plants.
- Identify the diversity of animals.
- Compare characteristics of plants and animals with respect to growth, mode of nutrition and movement.
- Examine given samples and identify the existence of microorganisms.
- Identify the diversity of microorganisms.
- Classify organisms as animals, plants and microorganisms.
- Use dichotomous keys to classify organisms.

Field trip

2.1

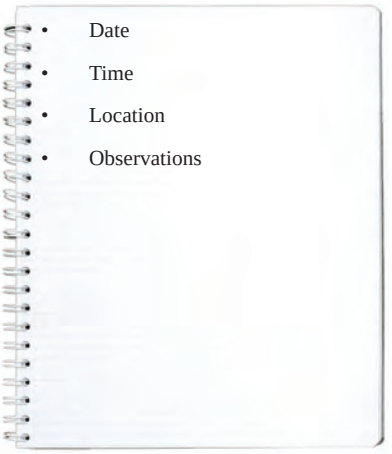
Dear students, all of you have gone on trips, haven't you? you may have seen diverse things on those occasions. Perhaps you may have visited waterfalls, sea, forests, and elephants. They are the natural endowments of our country. Apart from that, you must have seen important archaeological sites like Sigiriya, Yapahuwa, and Galle fort. All of you in 6th grade are going to start this module with such a trip. This would be the school garden or a place close to school, organized by your teacher. However, it is not just to observe and get back, but it is to investigate and explore.

There are several things you should know before an investigative trip. Your teacher will tell you about it.

Figure No:2.1.1

Field note book

In future, you may become a scientist who discovers new things. So let us start practicing some simple habits from now onwards.



You must have prepared a field note book by now, according to the instructions given by the teacher. It is a small note book which you can carry even in your pocket. You can either buy or make one using the remaining pages of old note books.

You must take a field notebook on a field trip. Use this book to write fascinating or new things observed in the field which you have not seen or did not know up to now. Use the pencil to write in the field note book

It is important to mention the date, time, place and incident in the field note book.

In addition, find a hand lens, thermometer, binoculars, measuring tape and a camera if there is a possibility.

Hand lens Thermometer

Figure No:2.1.2

Take a few empty bottles with wide mouths and few clean empty polythene bags to collect samples .

It is good to have several pairs of gloves also . If you can take a hat, the intense sun wouldn't be a problem. Take any other thing which you may feel will be necessary. Having a check list will be useful for this purpose.

Everybody in the group should contribute to the maximum success of his/her group. Your teacher will award marks to each group for this activity. Recall the instructions given by your teacher before you start the field visit. It is very important to take responsibility not to harm anything in the environment. No plant or animal should be harmed. It is important to be mindful of your safety. In this task, it is important that you obey the group leader.

Your group will be provided with an environment monitoring data sheet by your teacher. You have to complete it as a group. Therefore, observe the environment thoroughly more than you do on other days. Try to find things you haven't seen earlier. Take photographs whenever possible. If you have access to a camera it will be useful for this purpose.

Draw diagrams of observable plants and animals, whenever possible. Paste plant leaves and flowers.

Environmental monitoring data sheet

1. Name / Number of the group:
2. Date and time:
3. Environment observed:
4. Temperature in the environment :
5. Sketch of the observed environment :

By now, you must have planted two plants in your garden according to the instructions given by the teacher. One of them should be a plant which blooms and bears fruits within a few weeks. You can plant it even in a pot. Other plant should be a permanent one. (ex: coconut, mango, jack). It is necessary to keep a record on the growth of these plants in your field note book. Marks will be assigned for this.

2.1 Collection of information by observing the selected environment

Activity 2.1.1

Let's observe the environment

Now you are prepared for the group activity. Observe the environment carefully and complete the table as a group.

Number	Things observed	Plant	Animal	Neither a plant nor an animal	If it is a plant or an animal what is the character you used for the identification
1	Ex: Coconut tree	√			stem, branches and leaves present
2	Earthworm		√		Moves slowly
3	Shell of a snail			√	
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

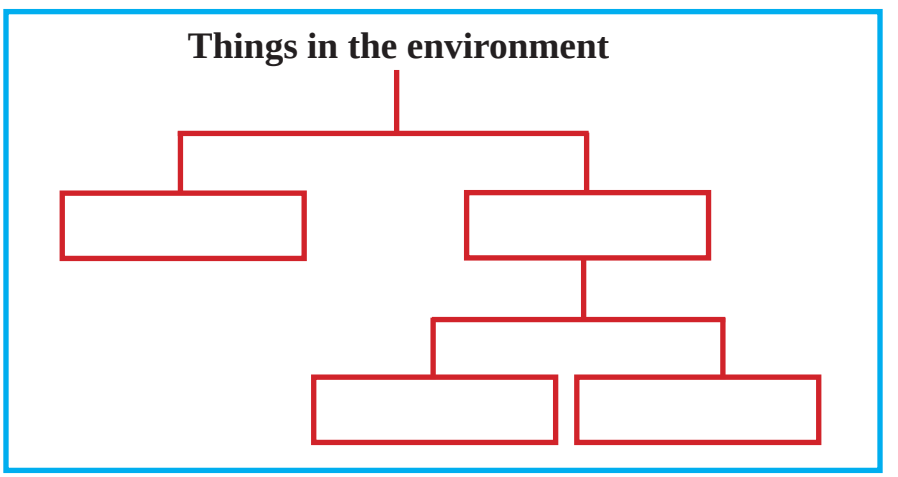
Table 01- Identification of the components in the environment

According to the above table you can see that the things in the environment can be grouped as plants/ animals and not belonging to plants or animals

Suggest a common name for the things which cannot be grouped as animals or plants in the above table

Give a common name for plants and animals taken collectively

Using the above knowledge fill the chart given below



Write down characteristics used to identify organisms with the aid of information given in the last column of table no.1

1. .....

2. .....

3. .....

4. .....

2.1.2 Characteristics of organisms

Growth

Have you observed the changes which occurred with time in the plant you have planted in your home garden/school according to the instructions given by the teacher? What are they? Have the height and number of the leaves increased?

Why did it happen?

You can understand that organisms or their organs increase in size with time. Production of a seedling from a seed, development of teeth in a child, increase in the height of a tree or animal over time are results of growth of an organism.

This characteristic is common to both plants and animals.

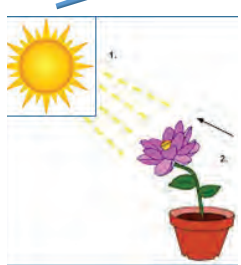
Nutrition

Energy is needed for the existence of animals and plants. Both animals and plants obtain energy from nutrients. Nutrients are obtained from food. Many plants produce their own food. Therefore, plants are also called autotrophs. Green plants use carbon dioxide gas in the atmosphere and water absorbed from the soil to produce food using solar energy. This process is called photosynthesis. Animals depend on food produced by plants, either directly or indirectly. Therefore, animals are called heterotrophs. Animals like deer and cows eat plants and depend directly on plants for food. Animals like lions and tigers eat other animals and depend indirectly on plants. The process by which organisms fulfill their need for food is called nutrition.

Respiration

You may have seen the upward and downward movement of the chest and abdominal areas in a still person. No doubt that you may have observed these types of movements of cats and dogs in your house. It happens due to their breathing in and out. The oxygen in the air thus obtained acts on the stored food in our body. The process of producing energy in the body by doing so is called respiration. During respiration oxygen gas is consumed and carbon dioxide gas is produced. Inhalation takes in the oxygen required for respiration and exhalation removes the carbon dioxide gas produced in respiration. Plants also can respire, but this process is invisible to our naked eye.

Movement



Organisms are capable of moving without external assistance. Animals have the ability of moving from one place to another (locomotion) and making other diverse movements as well. Though plants cannot move, they are capable of making other movements.

e.g. Drooping of Mimosa (sleeping plant) leaves when touched, a potted plant kept near a window moving towards the light.

There are animals which cannot move but can only make various movements. Sea anemones, corals are such animals that live in oceans.

Reproduction

Existing plants produce new plants from seeds, branches or by some other methods. Animals also give birth to young. For the continuity of living beings, one generation must give birth to another new generation. Thus the process of creating new organisms or breeding the species is called reproduction.

Summary

We shall summarize what you have learned up to now.

Things in the environment can be basically grouped as living and non living.

Common characteristics for living are:

- Growth
- Nutrition
- Movement
- Respiration
- Reproduction

2.1.3 Observation of plants

Activity 2.1.2

Let's observe plants

Observe the plants in your environment and fill the following table.

Number	Name of the plant	Nature			Branched/ unbranched	Special information
		Herb	Tree	Creeper		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Table 02

2.1.4 Observation of animals

Activity 2.1.3

Let's observe animals

Observe some animals in the environment and fill the table below (Mark √ wherever appropriate)

Number	Name of the animal	Site / place where the animal was observed	With legs	With body hair	With wings	With fins	Other special information
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Table 03

- Include information of animals which you cannot observe but can identify by the sounds they make.
- If you observe something special in the environment, note that in the field note book, with the date. Draw sketches of a few animals you have observed.
- Present observations of your group (This can be done even in the field).

Difference between plants and animals

2.2

Activity 2.2.1

Let's identify the differences between plants and animals – 1

Complete the table No.5 given below by selecting the organisms which can produce their own food from the given pictures.

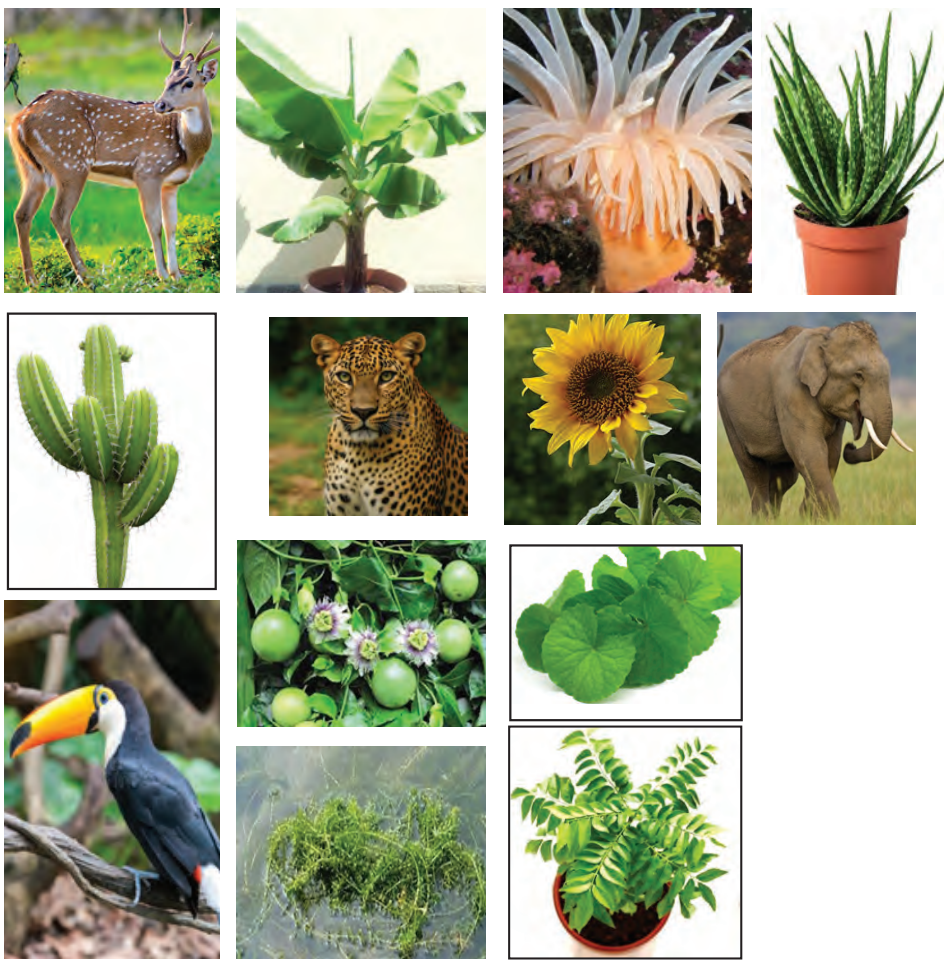


Figure No: 2.2.1

Organism	Produce their own food/ do not produce their own food

Table 05

Organisms which produce their food by themselves are…… (plants/animals).

Role play

Activity 2.2.2

Let's identify the differences between plants and animals – 2

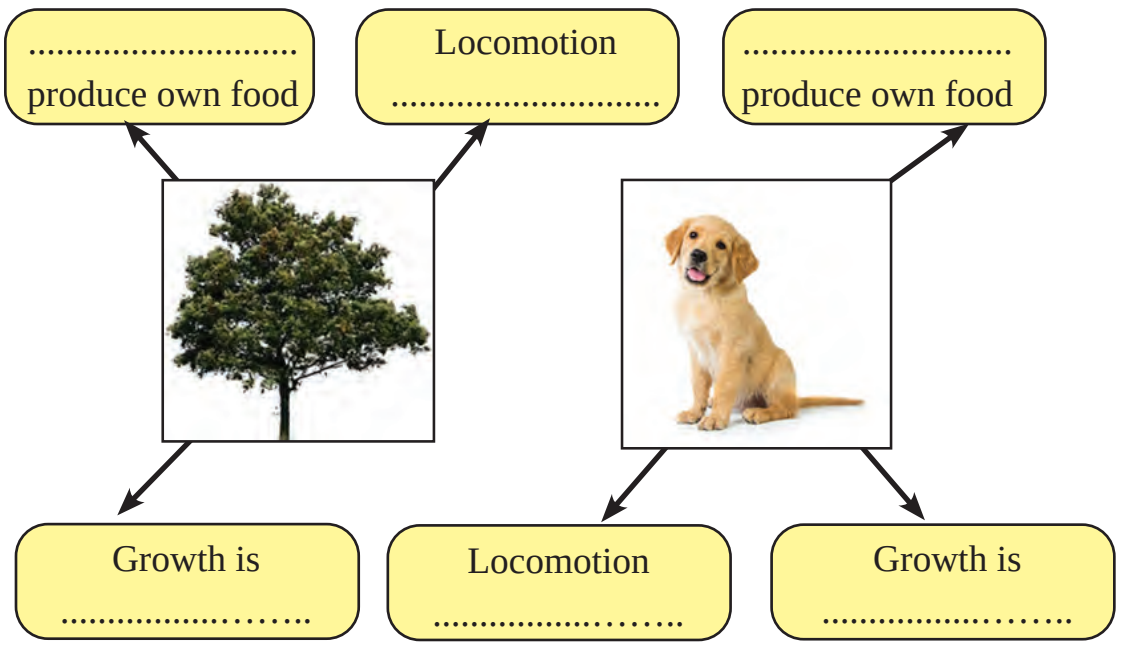
Perform a role play, with the participation of about 10 members in total and by selecting at least one member from each group. Few plants and different types of animals should be taken as characters.

In the performance following points should be highlighted

- Animals cannot produce food (therefore they depend on plants)
- Plants cannot move from place to place (animals move to find protection, food and partners for reproduction).
- Growth becomes limited after a certain age limit in animals (plants grow throughout their life time).

Complete figure 01 associated with the role play.

Figure 01



Complete figure 01 referring to the role play. Use the words given below to fill in the blanks

does, does not, limited, unlimited, is there, not there

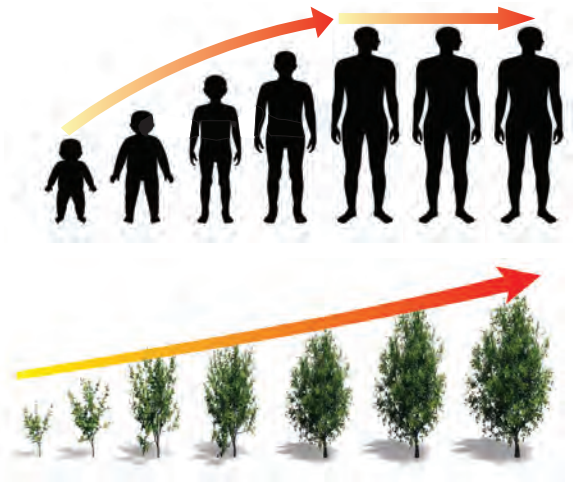


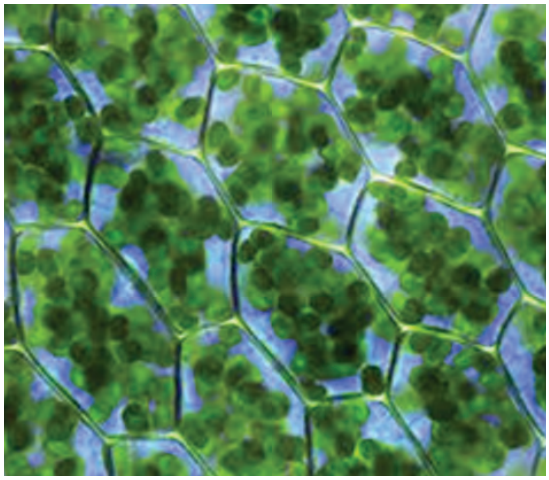
Figure No:2.2.2

From this diagram you will be able to see that with time growth of the animals is limited and that the growth of the plants does not stop with time.

For further studies

Plants provide food to the world. Therefore animals cannot live on earth without plants. Plants have got the specific capability of producing food due to the presence of chlorophyll in the leaves. Accordingly , another difference between plants and animals is the presence of chlorophyll in plants and absence of chlorophyll in animals.

Plant leaves are green in colour because of chlorophyll.



Magnified picture of chlorophyll in a plant leaf

Figure No:2.2.3

Now you know that the food which is required for this world is produced by plants. Do you know that in this process plants also produce oxygen which is required for breathing?

Therefore, when you plant and look after a tree it means that you are contributing to the production of food and oxygen for the world.

Find out the uses and economical benefits of the plants you have planted.

Microorganisms

2.3

Activity 2.3.1

Let's find the reason for changes in food

Take two samples each of the following materials and keep one sample in the refrigerator and the other under normal environmental condition for 2 – 3 days.

● Coconut water ● Milk ● Slice of moist bread ● Small quantity of rice (cooked)

Observe the changes occurred and note them in the table below.

Material	Observation of the refrigerated sample	Observation of the unrefrigerated sample
coconut water		
milk		
slice of moist bread		
small quantity of rice (cooked)		

Table 06 - Change in food with time

What could be the reasons for above observations?

.....

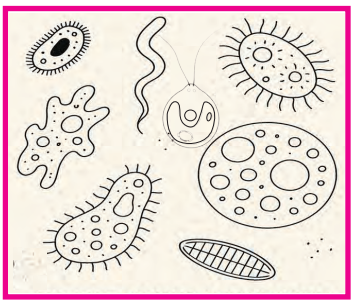
.....

With the help of your teacher observe small quantities of the following using a light microscope; Fermented hay infusion, yeast and pond water.

Activity 2.3.2

Let's find the diversity of microorganisms - 1

Observe the samples A,B,C under light microscope. Connect the diagrams (1,2,3) given below to the samples you have observed.



Pond water

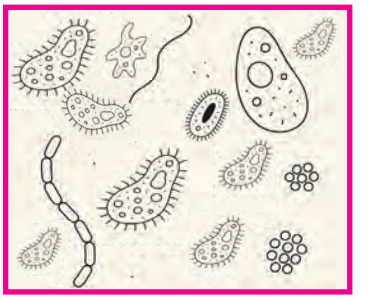
1

.....

Yeast

2

.....



Fermented hay infusion

3

.....

There are organisms which cannot be observed with the naked eye. As they cannot be observed by naked eyes they are known as microorganisms. Diverse groups of microorganisms live in diverse places of the environment. Though they are not seen with the naked eye, some microorganisms can be observed with light microscope. To observe some other microorganisms more powerful microscopes than light microscope are needed.

Magnified pictures of some categories of microorganisms observed with such powerful microscopes are given below.


Bacteria


Virus

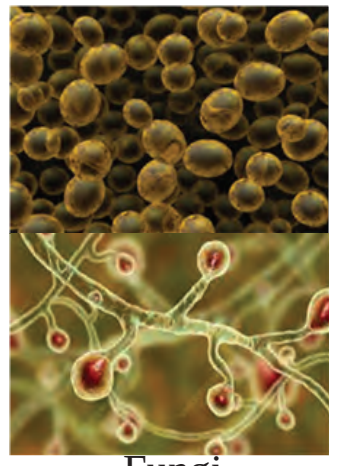

Fungi

Figure No:2.3.1

Activity 2.3.3

Let's find the diversity of Microorganisms - 2

Your teacher will evaluate this activity. Using the Internet create a short video on microorganisms of less than 03 minutes duration .(You can get the help from your adults in editing). Create a pictorial story less than 3 pages on microorganisms, if internet access is not available. One week time is allocated for this task.

Indicate √ mark in the relevant column according to the given organism

Organism	Animal	Plant	Microorganism
Weaver ant/dimiya			
Iron weed/ Monarakudumbiya			
Gray's leaf insect/pera kolaya			
Bacteria			
Tropical pitcher plant			
Fungi			
Moth			
Dengue virus			
Ferns			
Marygold			
Jackal jujube/ Eraminiya			
Black ruby barb			
Mosses			
Salvinia			
Pistia			

Table 07 - Distinguishing plants, animals and microorganisms

Identify the above pictures as plants or animals with the help of your teacher

Plant diversity

2.4

Activity 2.4.1

Let's identify the diversity of plants

Are all the plants in the world alike? You know very well that it is not. Have you ever keenly observed them to see that there are differences among them?

Observe the plants in your home garden or a selected environment and fill the table given below. When this lesson is discussed in the classroom make a group presentation, highlighting the plant diversity in concise form (photographs, pictures and videos can be used).

Number	Name of the plant	Nature of the plant (herb, tree, creeper)	Nature of the stem (Branched/unbranched, has flowers/no flowers, has roots from the stem/ no roots from the stem)	Nature of the root (If roots can be seen)	Nature of the leaves	Nature of the flowers	Nature of the fruits and seeds
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Table 08 - Plant diversity

Figure No:2.4.1 Diversity of Plants

- Did you see that there is a diversity as herbs, trees and creepers, among the plants you have observed?

- Did you see that some plants are branched and some are not? Some plants have fruits or flowers which develop on the trunk and in some others the roots are developed from the trunk.

- We cannot see the roots of many plants because they are found in the ground, but the roots that develop from branches and trunks, roots that run on the surface of the ground and float in the water can be seen.

- By now you have already learnt that many of the plant leaves appear in green color due to the presence of chlorophyll .There are some plants with other colours also. There are plant leaves with different shapes and sizes. In some plants roots are developed from leaves (Akkapana).

Diversity of plants from your view

i) Identify herbs, creepers and trees in your environment and draw a picture of each in the given box

A herb	A tree	A creeper

ii) Identify the diversity of plant stems and draw appropriate picture in each of the given cells.

Plant with a branched stem	Plant with an unbranched stem	Plant with flowers on stem	Plant with roots developed from the trunk

iii) Observe different roots and draw the appropriate picture in each of the given cells

Plant with roots inside the ground	Plant with roots from the branches	Plant with roots from the stem	Plant with roots floating in water

iv) According to the instructions given by the teacher gather leaves which have 10 different shapes and dry them. Once dry paste them on a sheet of paper.

- There is a marvelous diversity among the flowers. They are of different colours, shapes, scents and with diverse numbers of petals. Some are single and some develop in clusters.

v) According to the instructions given by the teacher draw 10 different types of flowers to depict diversity of flowers.

- There are several differences between fruits and seeds too. These differences exhibit a diversity according to colour, shape, size and the number of seeds in a fruit. In many seeds there is a relationship between the shape, size and the mechanism of dispersal.

vi) Draw 10 different types of seeds /fruits in your home garden/ school garden

You have been invited to deliver a five minute speech on Diversity of plants for environmental society of grade 4 students. Write down the speech you are planning to deliver.

Now you have observed that there are trees of different sizes, branched trees (mango, jack, cashew), unbranched trees (coconut, palmyrah, kithul palm) and that some of these plants have flowers on their stem (cannon ball tree-sal, cocoa, cucumber tree-bilin).

There is a diversity of roots also. Most of the roots are underground. In addition, some roots originate from the stem (stilt roots), some roots originate from branches (prop roots) and there are floating roots too (aquatic plants such as *Pistia* and *Salvinia*), There is a great diversity of flowers also. It means flowers are diverse in colour, shape, size and fragrance.

Leaves also have diversified shapes, sizes, colours and venation patterns, single leaves and multiple leaves. Seeds of plants are diverse in shape, colour and size.

Therefore, now you have surely understood that diversity in plants makes the world beautiful.

Animal diversity

2.5

Activity 2.5.1

Let's find the diversity of animals

Watch the video shown by your teacher attentively.

Fill the table, using the information from the video.

How many different types of animals were there?	
What are the animals with legs?	
What are the types of animals with body hair?	
What are the animals with feathers?	
What are the animals that can swim?	
What are the animals that walk?	
What are the animals that crawl?	
What are the largest and smallest animals shown in the video?	
What are the multicolored animals?	
What are the environments that these animals live in ?	

Animal world has become a beautiful and wonderful place because animals are different in size, shape, colour, mode of locomotion and environment they live in. Diversity creates variety.

Imagine a situation in which all organisms in the world are destroyed due to human activities or other causes, except yourself. Transform your feelings in such a situation into a creation.

For further studies:

Ministry of Education – E thaksalawa – Wonders of the living world (Grade 6)
https://www.e-thaksalawa.moe.gov.lk/moodle/course/view.php?id=3

National Institute of Education – Guru gedara
https://www.youtube.com/watch?v=CAbtHH4-Tc-M&list=PLlyv4_Vxwl-y25zgvPO0xTwnkL5a0oy4N&index=2

Dichotomous keys

2.6

Activity 2.6.1

Let's classify organisms - 1

Bring ten buttons of different sizes, shapes, and colours according to the instructions given by your teacher.

Keep them on the table and divide them into two groups using any feature you like.

Divide each of the above groups again into two groups using other features. Continue this division until a single button is left.

(You can take diverse coins or stamps too.)

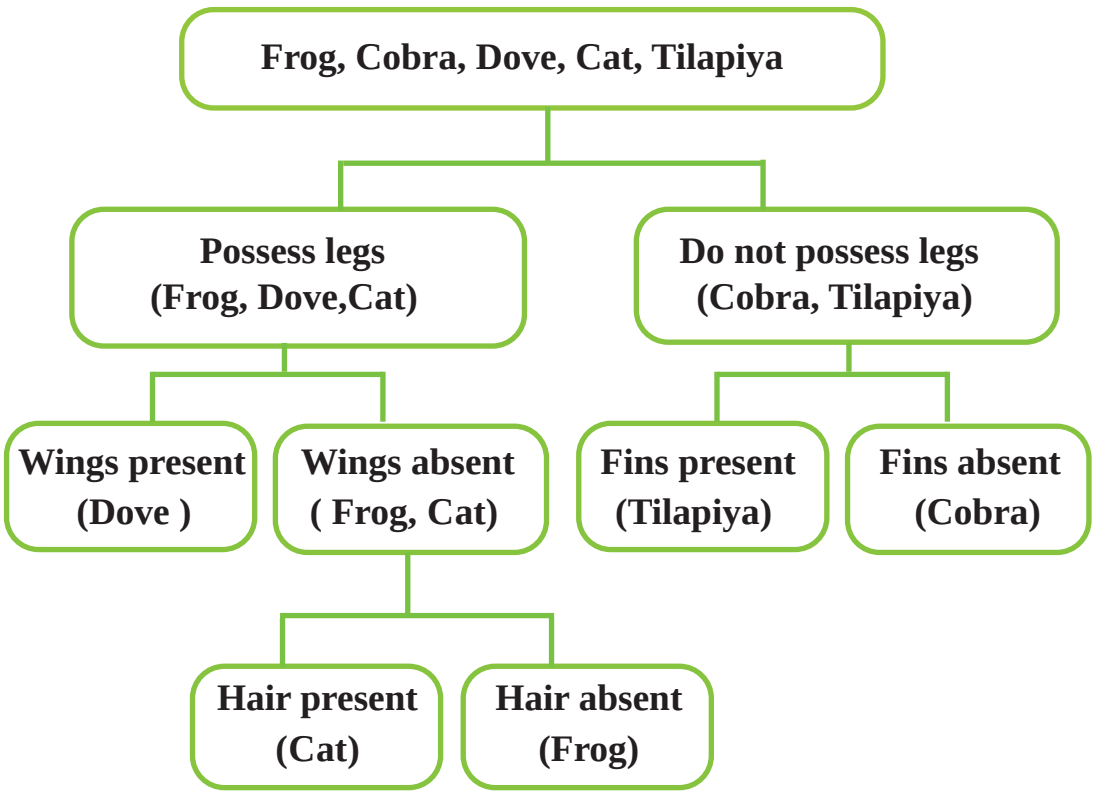
What you have done is classifying of buttons using a certain feature.

This is a dichotomous key. Dichotomous key is a simple scientific system to classify organisms.

In each division of the dichotomous key objects taken into consideration are divided only into two parts. Only one criterion is considered at a time. It is grouped on presence/absence (ex: possess wings/ do not possess wings)or more/less (ex: possess two legs/ possess more than two legs)

Let us classify following animals using a dichotomous key.

frog, cobra, dove, cat, tilapiya



Activity 2.6.2

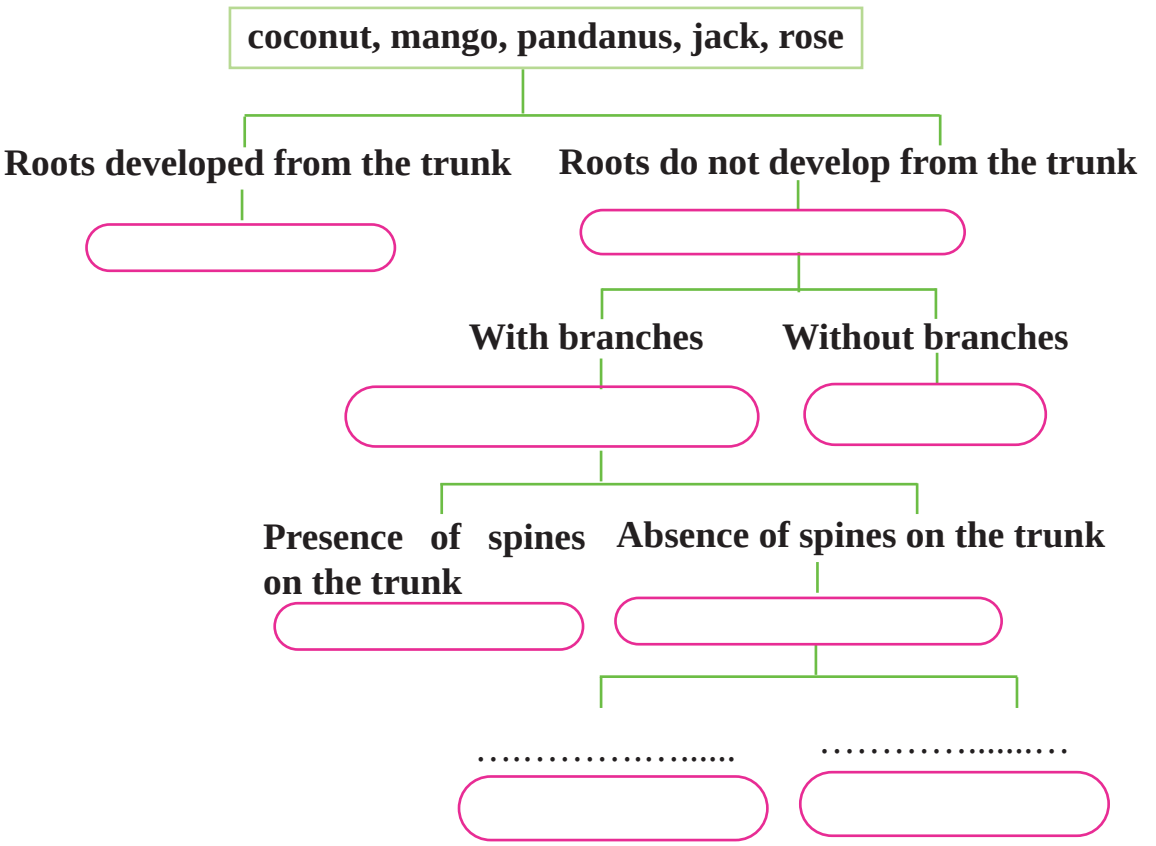
Let's classify organisms – 2

Divide the following animals using a dichotomous key. Tortoise, millipede, cow, parrot, lula (snake head fish)

Activity 2.6.3

Let's classify organisms - 3

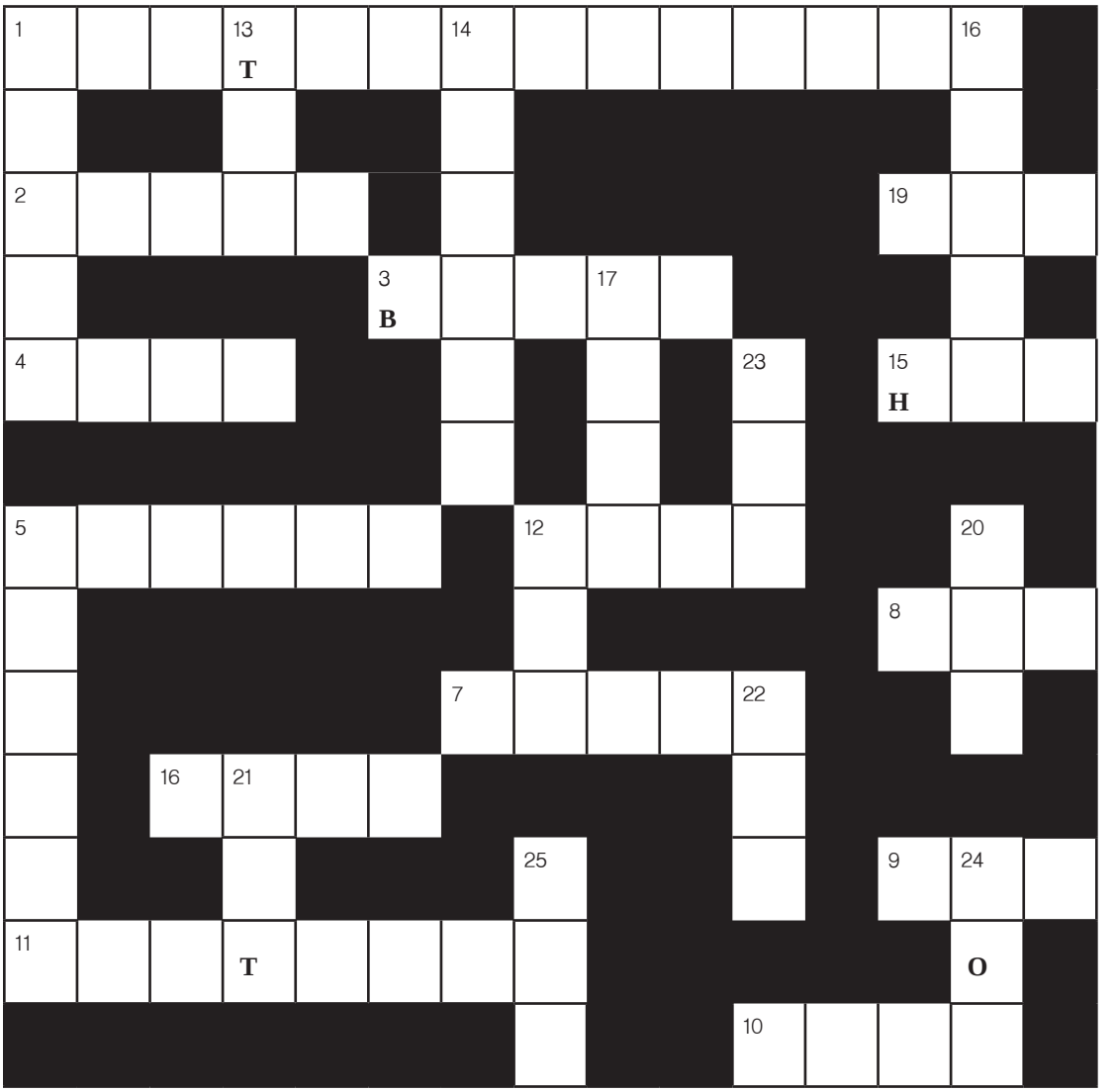
Divide the plants coconut, mango, pandanus, jack and rose using a dichotomous key.



Exercises

You like to test your knowledge and understanding on the things you have learned up to now, don't you. Shall we do the following exercies now?

01 Crossword puzzle



Across

01 A major biological process that can be used to differentiate plants from animals

02 Strong areal part of the tree which supports the branches

03 Colour of the mold found on moist stale piece of bread

04 An animal not found in Sri Lanka

05 Organisms that can produce oxygen

07 The structure that seeds are protected in

08 Light is emitted to the plants for photosynthesis by…….

09 What you have to do to the leaves before you paste them on a card

10 The structures that anchors the plant to the ground

11 An animal with four legs and has a shell

12 An animal which uses the tongue to catch the prey

15 A common domestic bird

16 Natural way of receiving water on Earth

19 Microorganisms can be observed in a ..... infusion

Down

1 One of the most colourful parts of a flower

5 A bird who feeds on fruits and nuts

12 Some animals have these on their body

13 Number of legs in a shrimp

14 Colour of sun flower

16 An animal without legs

17 Useful product from a tree

20 Flowers are formed from these

21 Very small animals attracted to food

22 Zebras have ……. pairs of legs

23 Some fish lay these

24 Mold can be seen when this happens to food

25 A commercial crop grown in our country

02) Fill the table given below by using the given plants

Name of the plant	Nature of the plant (herb, creeper, tree)	Stem branched/ unbranched, has roots from the stem/ has roots from branches	Roots are underground/ roots floating in water	Single flower/cluster of flowers Indicate colour of the flower
Palmyrah				
Betel				
Sensitive plant (Nidikumba)				
Jack				
Water hyacinth				
Shoe flower				
Passion fruit				
Banyan				
Golden shower (Ehela)				
Cashew				
Pepper				

03) Fill the table given below by using the given animals

Name of the animal	Has legs/no legs. If legs are present the number of legs	Presence of shell/ absence of shell	Wings present/ absent	Fins present/ absent	Environment
Millipede					
Dove					
Frog					
Tilapiya					
Rat snake (Garadiya)					
Squirrel					
Spider					
Worm					
Snake head fish (Lula)					
Earth worm					

Module 03

From the Universe to Our Home

Module 03
From the Universe to Our Home

By studying the module "From the Universe to our Home"you will be able to:

- demonstrate an understanding on physical characteristics of the components in our solar system.
- discuss different types of natural resources and their uses.
- apply observational, practical and inquiry-based skills to identify changes in weather and climate.
- report different types of natural disasters to promote awareness of common natural disasters in Sri Lanka.

Sun and its companions

3.1

As a pre-preparation for the lesson, thoroughly observe the day and night sky with your family.

Choose a suitable safe place that has less obstructions to see the sky clearly.

DO NOT look at the Sun with naked eye!
Be cautious about your surroundings!

Activity 3.1.1

Who observed the sky yesterday?

Draw and label the things you observed in the sky.

Day Sky

Night Sky

Fill the given table 3.1.1 using (✓) mark for things that you observed in day sky and night sky.

Things that are observed in the sky	Day sky	Night sky	Special facts
Sun			
Moon			
Clouds			
Rainbow			
Stars			
Planets			

Table 3.1.1

What are the flickering and non-flickering objects you observed in the night sky?

The flickering objects are **Stars.** Sometimes, stars can appear in different colour. Non-flickering objects are planets.

Do you know about the Universe, Galaxies, and the Solar System?

We all observe the sky with amazement from a very young age. Astronomy has developed based on the sky observations of humans for thousands of years. Mankind has created hightech equipment for observation and expedition of the sky. This has led to uncover many facts of the Sun, Moon, Planets, Stars like celestial objects and unending Universe.

According to astronomical findings the universe is made up of many galaxies. A galaxy is a huge collection of gas, dust, stars and solar systems that held together. **Galaxies** come in different sizes. The **Milky Way** is our galaxy that consists of 200 - 400 billion stars. The Milky Way is large but our neighbouring Andromeda galaxy is much larger.

'Our **Sun**' is just one star among the billions of stars in the Milky Way. Hence there are many solar systems within the Milky Way.

Figure 3.1.1 Milky Way

Our **Solar System** consists of the Sun and its orbiting planets including the Earth and other planets, sub-planets, asteroids, rocks, and dust. Figure 3.1.1 shows you the Milky Way, our galaxy. Our solar system is a small part of it.

Activity 3.1.2

Let's identify the planets in our solar system

Our solar system consists of eight planets. Figure 3.1.2 shows our solar system.Try naming the planets.

Venus *Jupiter* *Mars* *Neptune*
Earth *Uranus* *Mercury* *Saturn*

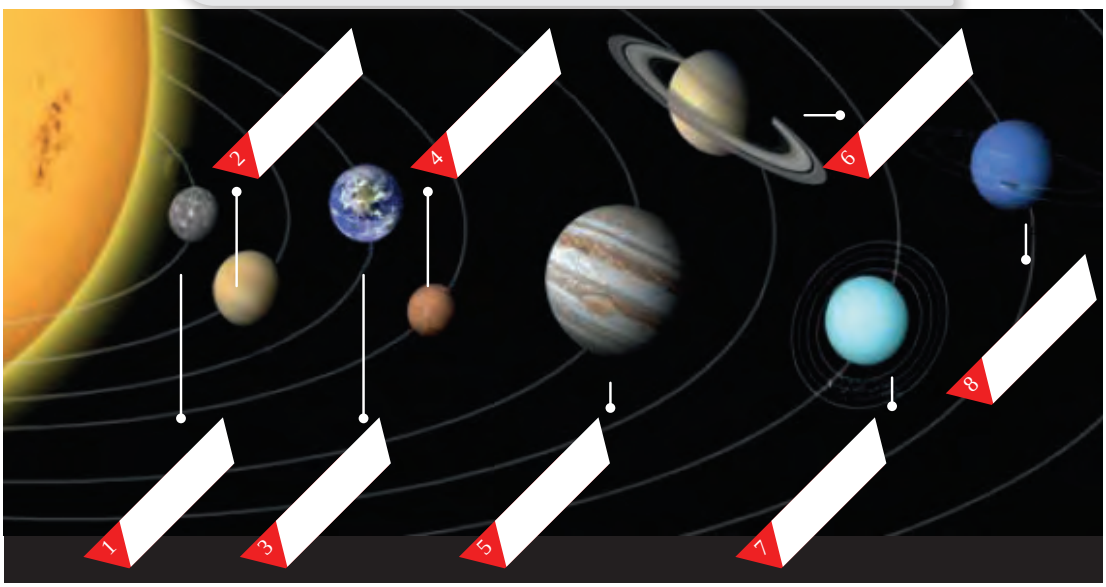


Figure 3.1.2 Our solar system

A planet rotates around its axis. The path that planet spins around the Sun is called an orbit. All planets demonstrate a tilt from the axis.

Figure 3.1.3 Earth's tilt from the axis

Planets rotate around their own axes while revolutions around the Sun. Rotation time is the time taken by a planet to rotate around its own axis. It is a day's time of the respective planet.

Example: Earth's rotation time is 24 hours. Hence, earth's one day is 24 hours.

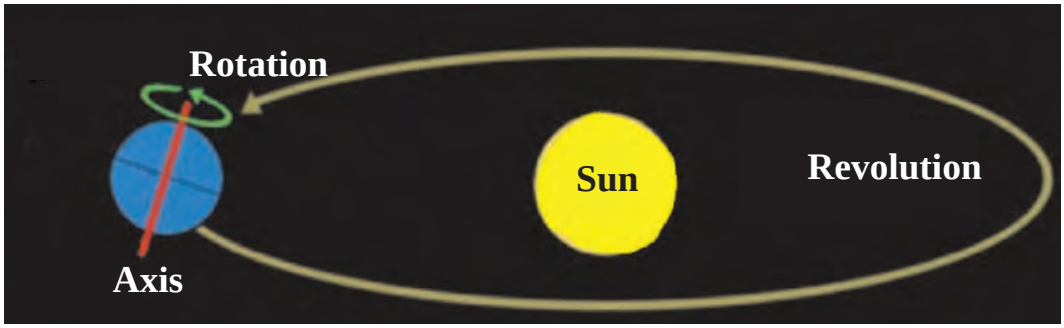


Figure 3.1.4 Earth's rotation and revolution

A planet's revolution time is the time taken to move around the Sun. It is a year's time of the planet.

Example : Earth's revolution time is 365.25 Earth days. It is one year's time on the Earth.

The Moon is the sub-planet of the Earth. It revolves around the Earth.

Figure 3.1.5 Our moon

Details of planets of the solar system are given in the table 3.1.2

Planet	Distance from the sun (Kilometre Million)	Diameter (Kilometre)	Rotation Time (Earth days)	Revolution time (Earth Years)	Tilt from axis (0)	Number of sub planets (Upto 2024)
Mercury	57.9	4879	58.65	0.24	0.1	0
Venus	108.9	12104	243	0.62	177.4	0
Earth	149.6	12756	1	1	23.4	1
Mars	227.9	6792	1.03	1.88	6.7	2
Jupiter	778.6	142984	0.41	11.86	25.2	95
Saturn	1433.5	120536	0.44	29.46	3.1	274
Uranus	2872.5	51118	0.72	84.01	26.7	28
Neptune	4495.1	49528	0.72	164.8	97.8	16

Table 3.1.2

Exercise 3.1.1

Let's get to know about planets

Answer the following questions.

1. Which are the **closest** and the **farthest** planets to the **Sun**?

   Closest planet _____

   Farthest planet _____

2. Which are the **closest** and the **farthest** planets to the **Earth?**

   Closest planet _____

   Farthest planet _____

3. Which are the **largest** and the **smallest** planets of the solar system?

   Largest planet _____

   Smallest planet _____

Some interesting facts about our solar system

Sun

» It is the main component and the largest object of our solar system.

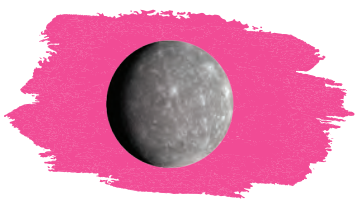
» It is a hot star, with glowing gases. Its surface temperature is 5500 ^{0}C.

» Its gravity holds the solar system together including the largest planet to the smallest particles of debris.

» Though it is the largest object in our solar system, the Sun is not as large as some other stars.

» There are billions of stars like our Sun scattered across the Milky Way galaxy.

» The connection and interactions between the Sun and the Earth influence our planet's weather, climate, seasons, ocean currents, radiation belts and aurora.



Mercury

» It is the smallest planet in our solar system and slightly larger than the moon.

» Its one day is 59 Earth days, and a year is 88 Earth days.

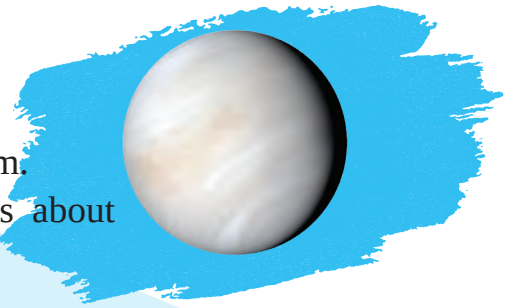
» It is a rocky planet.

» It is the second hottest planet in our solar system.

» There are no sub-planets or rings.

» There is no evidence for life.

Venus



» Equal to the size of Earth.
» It is the hottest planet in our solar system.
» One day is 243 Earth days, a year is about 225 Earth days.
» It has a solid surface with volcanoes.
» It has no sub-planets or rings.
» The brightest planet in the night sky.
» Known as 'the morning star' and 'the evening star'.

Earth

» It is our home planet.
» It is the only planet in our solar system with liquid water on the surface.
» Outer surface is mostly covered with water, the rest is a rocky surface with mountains, canyons and plains etc.
» A day on the Earth is 24 hours, a year is about 365 days.
» It has one sub-planet (moon) and no rings.

Mars

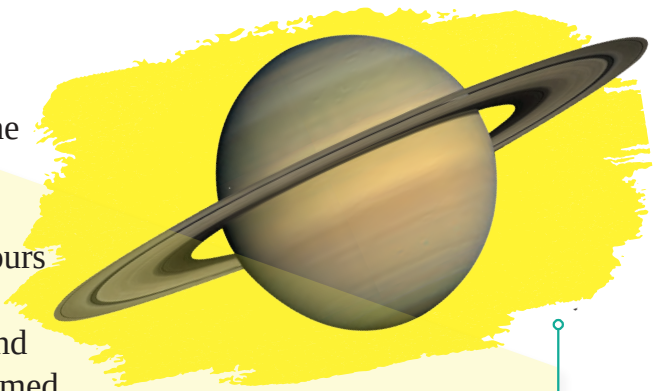
- A dusty, cold, desert planet.
- One day is a little over 24 Earth hours, a year is 687 Earth days.
- It is a rocky planet.
- It has two sub-planets and no rings.
- It is also known as 'the red planet'.

Jupiter

- It is the largest planet in the solar system.
- A giant gaseous planet.
- One day is about 10 Earth hours, a year is about 12 Earth years.
- It has 95 known sub-planets and a ring system.

Saturn

- The second largest planet of the solar system.
- A giant gaseous planet.
- One day is about 10.7 Earth hours and a year is 29 Earth years.
- It has 274 known sub-planets and 29 sub-planets yet to be confirmed, also it consists of a spectacular ring system with seven rings.



Uranus

- » It is also known as 'the sideways planet'.
- » It is a giant ice planet.
- » One day is about 17 Earth hours and a year is about 84 Earth years.
- » It has 28 known sub-planets and 13 rings.

Neptune

- » It is the only planet in our solar system that is not visible to the naked eye.
- » It the giant, gaseous, ice planet.
- » One day is about 16 Earth hours and a year is about 165 Earth years.
- » It has 16 known sub-planets and it consists of at least five main rings.

Use the above facts to improve your knowledge. Note that numerical facts are not required to be memorized. Also use the following links to obtain extended knowledge on: Solar system expeditions conducted by NASA, NASA kids' clubs and their activities, Sri Lanka Planetarium and Arthur C Clark Institute for Modern Technologies.

https://solarsystem.nasa.gov/

https://www.nasa.gov/kidsclub/

https://spaceplace.nasa.gov/

https://www.planetarium.gov.lk/

https://www.accimt.ac.lk/

Activity 3.1.3

Let's make a 3D solar system model

What you need

- Balls in different sizes
- Water colours/ paint
- Papers
- Metre ruler
- Hanging materials
- A pair of scissors
- Glue

Preparation tips:

Let's make planets first.

1. Decide on the sizes of balls, you are going to use for each planet and the Sun.

You can use balls, prepared using newspapers and glue or any eco-friendly material.

* Get assistance from your teacher to sort out the most suitable size for each planet. Figure 3.1.6 represents the diameter of a planet.

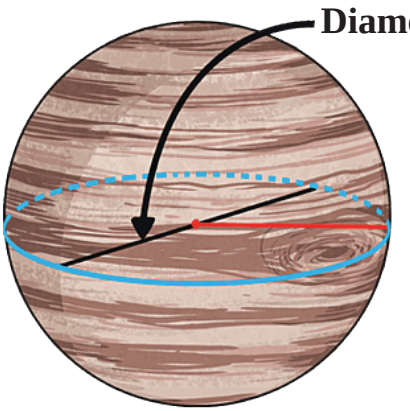


Figure 3.1.6 Diameter of a planet

Planet	Diameter in Kilometre
Mercury	4879
Venus	12104
Earth	12756
Mars	6792
Jupiter	142984
Saturn	120536
Uranus	51118
Neptune	49528

Table 3.1.3

2. Decide on the colours you will use for each planet and the Sun.

Discuss with your teacher to decide colours. Paint or colour them as appropriate to look more attractive.

Figure 3.1.7 shows you how they look after preparation.

Figure 3.1.7 Planet models

You can try making rings for the planets as well.

Let's adjust the distance from the Sun

3. Considering the given distances from the Sun to each planet in table 3.1.4, decide the distance of each planet from the Sun in your model. Your teacher will assist you to decide distances.

Planet	Distance from Sun/ Kilometre Million	Distance from Sun/ AU
Mercury	57.9	0.38
Venus	108.9	0.72
Earth	149.6	1.0
Mars	227.9	1.5
Jupiter	778.6	5.2
Saturn	1433.5	9.5
Uranus	2872.5	19.2
Neptune	4495.1	30.1

Table 3.1.4

1 Astronomical Unit (AU) is the distance from the Sun to the Earth's orbit, which is about 93 million miles (150 Kilometre Million).

Prepare hanging material for your planets in relevant sizes.

Now let's make the 3D model

4. Prepare your 3D model using previously prepared planets and the hanging material.

Additionally you can prepare other components of the space or label planets accordingly to make your model more attractive.

Figure 3.1.8 shows Orrery apparatus (a typical model of the solar system) that you can see in your school laboratory.

Figure 3.1.8 Orrery apparatus

Activity 3.1.4

Who am I?

Teacher will assign you to one of the eight groups. Study the given planet with your group members and get prepared to present it to the class.

Role play: Discuss "what you are" with your classmates.

- **Dress code :** Use as most appropriate to the planet assigned to your group.
- **Group :** All group members should participate in the role play.
- **Discussion :** Should be mainly focused on special features of the planets.

Exercise 3.1.2

Let's get to know more about the Earth

Answer the following questions.

1. How does our planet differ from the other planets in the solar system?

Colour	
Size	
Position	
Sub-planets	
Other	

2. Why should we protect the Earth?

Exercise 3.1.3

What have I learnt?

Fill the puzzle referring to the given images of the planets.

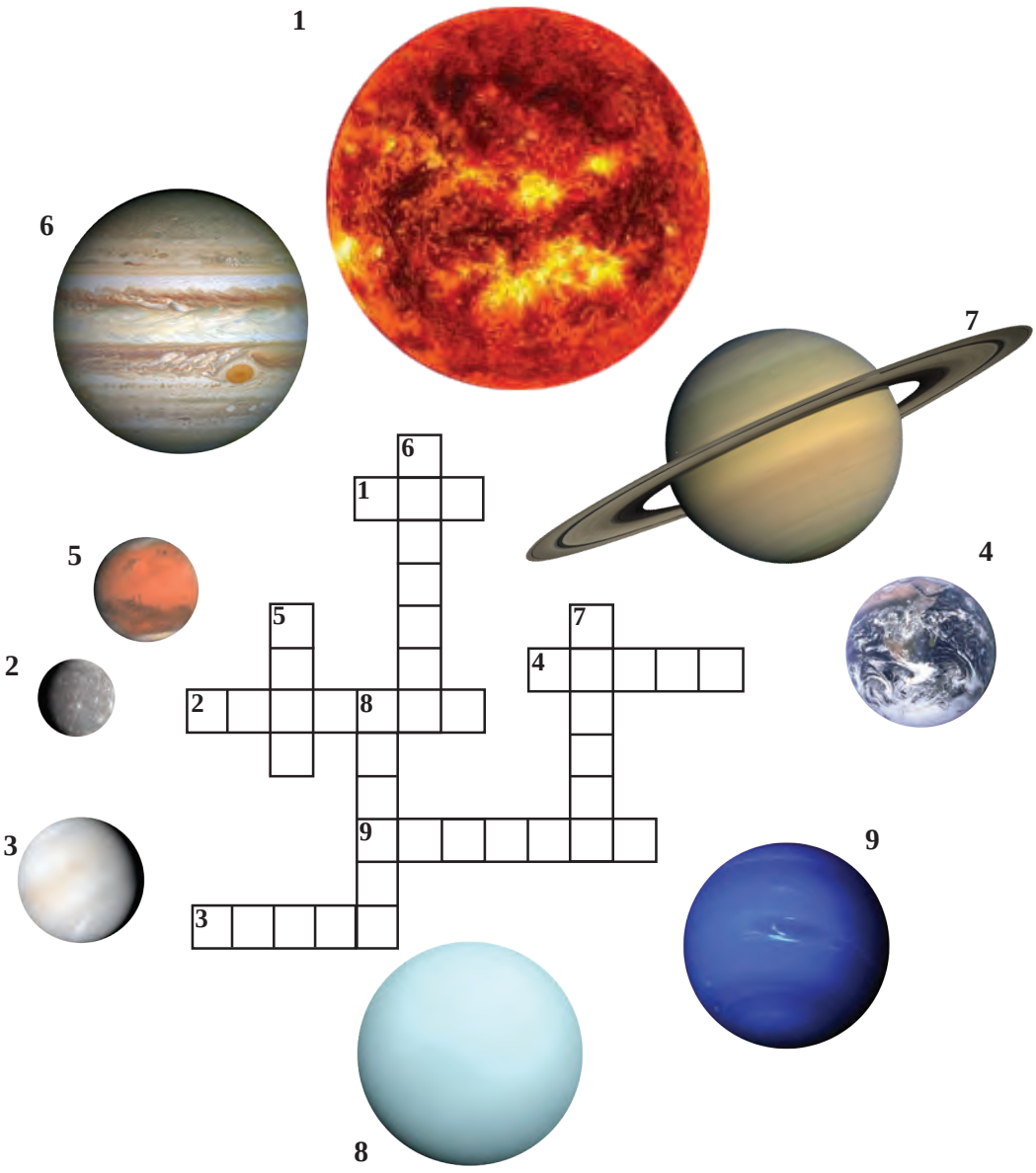


Figure 3.1.9 Puzzle

1 ★	2 ★	3 ★	4 ★
I could not complete the puzzle accurately.	I completed the puzzle accurately with the help of my friend.	I completed the puzzle accurately by myself referring to the given reading material.	I completed the puzzle accurately by myself. I can help others too.

Valuable gifts of nature

3.2

Activity 3.2.1

What will happen?

Discuss the above issues with your classmates. Write down the importance of resources that we receive naturally from the Earth and how difficult to live without them.

What are 'Natural Resources'?

Substances that are useful to humankind and found naturally on the Earth are natural resources.

Exercise 3.2.1

Let's identify natural resources

In relation to the above definition, identify the natural resources in figure 3.2.1 and mark them.

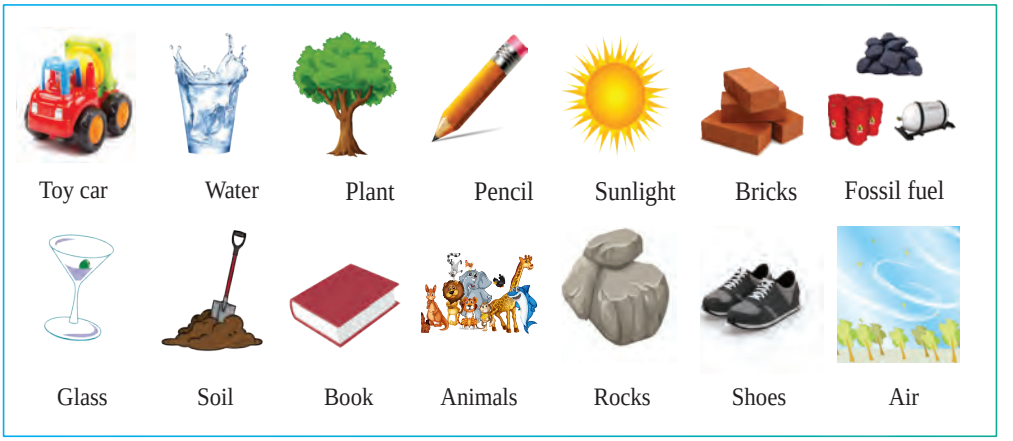


Figure 3.2.1 Natural resources and various objects

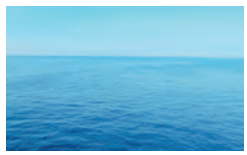
Given below is a section of an article on natural resources.

> All living beings depend on resources that exist freely in nature for their survival. Some of them are water, air, soil, plants, animals, fossil fuel, rocks and minerals.
>
> All mentioned above are naturally existing in the nature without any interference of mankind and they can be considered as gifts of nature. They are called natural resources and the basis of life on the Earth.
>
> They can exist as solids, liquids or gases. They can also be consumed directly or indirectly.

Activity 3.2.2

Let's identify the uses of the most common natural resources

Identify the following natural resources and write down their uses in the given boxes.

Water 	Air 
Plants 	Animals 
Fossil fuel 	Soil 

Natural resources are very important for our day-to-day activities and as raw material for some products that we use in everyday life.

Have you ever seen a traditional kitchen set up as shown in the following picture?

Figure 3.2.2 Traditional kitchen

Now you can identify objects made of natural resources in your classroom.

Activity 3.2.3

Let's identify the things made from natural resources in our classroom

Can you identify natural resources used as raw materials to make objects/ instruments in your classroom?

Objects / Instruments	Natural resource/resources used to produce
e.g : Book	Plants
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Table 3.2.1

1 ★	2 ★	3 ★	4 ★
I was able to accurately identify three objects/ instruments in the classroom and natural resources used to produce them.	I was able to accurately identify five objects/ instruments in the classroom and natural resources used to produce them.	I was able to accurately identify seven objects/ instruments in the classroom and natural resources used to produce them.	I was able to accurately identify ten or more objects/ instruments in the classroom and natural resources used to produce them.

Following is an article on natural resources.

All living beings need water to survive. Most living beings can live for weeks without food but can live only few days without water. Living beings essentially require water to grow and reproduce. Water exists on Earth's surface in lakes, rivers, glaciers as well as below the surface as groundwater. Water is used in agriculture, household activities, transport, sports, entertainment, industries and environmental activities.

Water

Plants

Plants play a vital role in the Earth's ecosystems because of photosynthesis, which means they produce oxygen while carbon dioxide is drawn from the atmosphere. Plants provide food and raw materials for the products ranging from clothing, furniture, medicine and fuel. Plants are used as a source of energy from ancient times. Plant roots bind and anchor soil in place to reduce erosion.

Animals both large and small, are important components in our environment. They provide food and other products useful to humans. Livestock, provide us food, fibre, fur and leather. Wild life including birds, fish and insects are important to support the web of activity in a functioning ecosystem.

Animals

Air

Air is a mixture of gases that is composed of gases such as nitrogen, oxygen, and a very small amount of water vapour, carbon dioxide and other gases. Oxygen in the air is essential for the organisms to survive because they use oxygen to produce energy from the food they take. Carbon dioxide is a main raw material for photosynthesis. Air regulates the temperature of the Earth and causes different weather patterns.

The soil is formed by the breaking up of rocks due to various physical and chemical processes. Soil is essential for the existence of life on the Earth. Soil provides water and nutrients for plants, soil-dwelling microorganisms and animals. Soil supplies a medium for filtering and breaking down waste. A thin layer of soil, called topsoil, can support existence of plants including crops grown for food.

Soil

Rocks

Rocks contain some of the minerals that need for living beings. The fossil fuels, coal and natural gases are found in or between layers of rocks deep below the ground. Today, fossil fuels are considered the primary source of energy necessary for everyday life. Further, rocks are used for construction of buildings, roads and railways and for manufacturing cement. Gold, diamonds and gems are also obtained using rocks.

Activity 3.2.4

Mini-project on natural resources

What you need to do?

- Interview a person with working experience or with expert knowledge on a natural resource found in your area.

Tips: Your interviewee could be a person who is involved extensively in using a natural resource for an industry such as fishery, gem mining, pottery, crop cultivation, granite industry, coir industry, timber products, animal farming, brick industry, etc.

- Based on the discussion, write a short report including the points given below.

Note : Report should be hand written.
DO NOT type.
Limit to maximum five pages including the cover page.

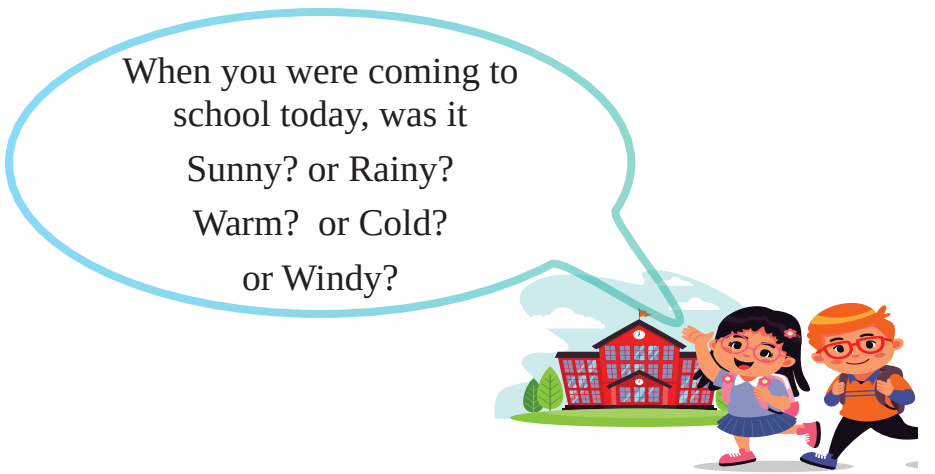
Content of the mini-project report on natural resources

- Person interviewed by you and the industry
- Location of the industry
- Main natural resources on which the industry is based
- Uses of the natural resources based on the respective industry
- Other raw materials
- Advantages and disadvantages of used natural resources related to the industry
- Observations of any misuse and overuse of natural resource used in the industry
- Your predictions on the future existence of relevant natural resources

Weather, climate and natural disasters

3.3

How is the weather right now? Check the environment outside.



The condition you feel and experience in the atmosphere for a short period of time is called **weather**. It is an atmospheric condition at a specific place.

Can you tell us how the weather is today? Was it same as yesterday?

Activity 3.3.1

Let's learn about the weather

Have you ever watched or listened to the weather segment in news on Television or Radio?

Check weather forecast report of the day using a smart phone or computer with the help of your teacher.

Tips: You can use https://www.weather.com or https://www.accuweather.com or the Department of Meteorology website - https://www.meteo.gov.lk/.

A screenshot of a webpage demonstrating a weather forecast is given in figure 3.3.1.

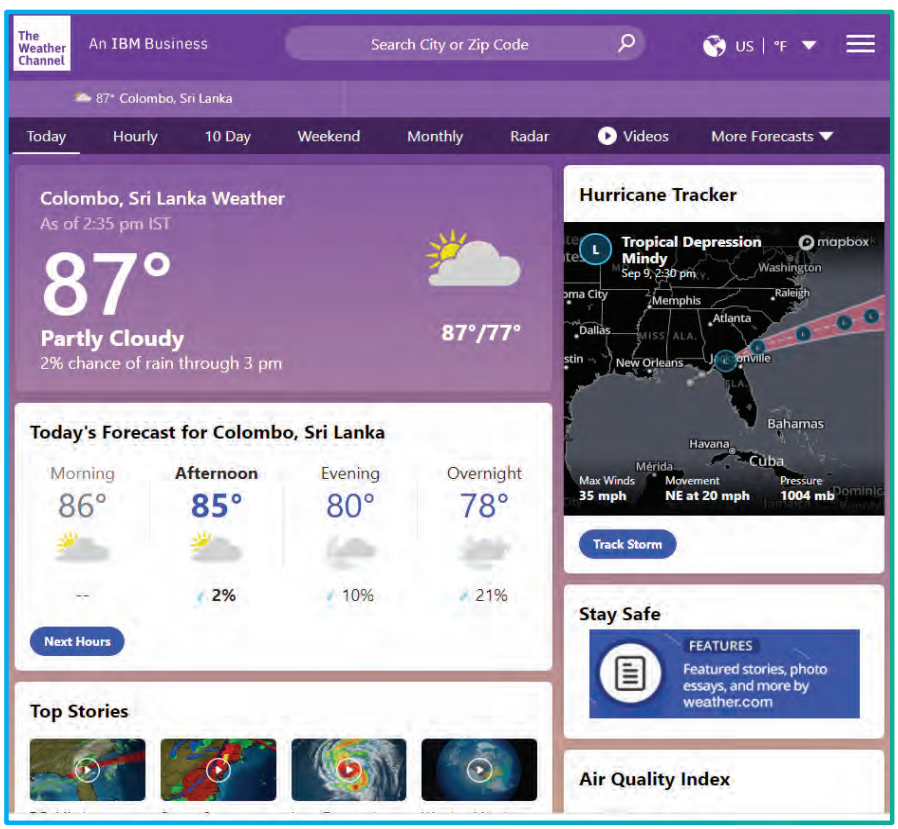


Figure 3.3.1 A web page with weather details

Many types of symbols are used in weather reports to represent different weather conditions. You are required to know about symbols to use in reports. Identify the weather conditions shown in figure 3.3.2.

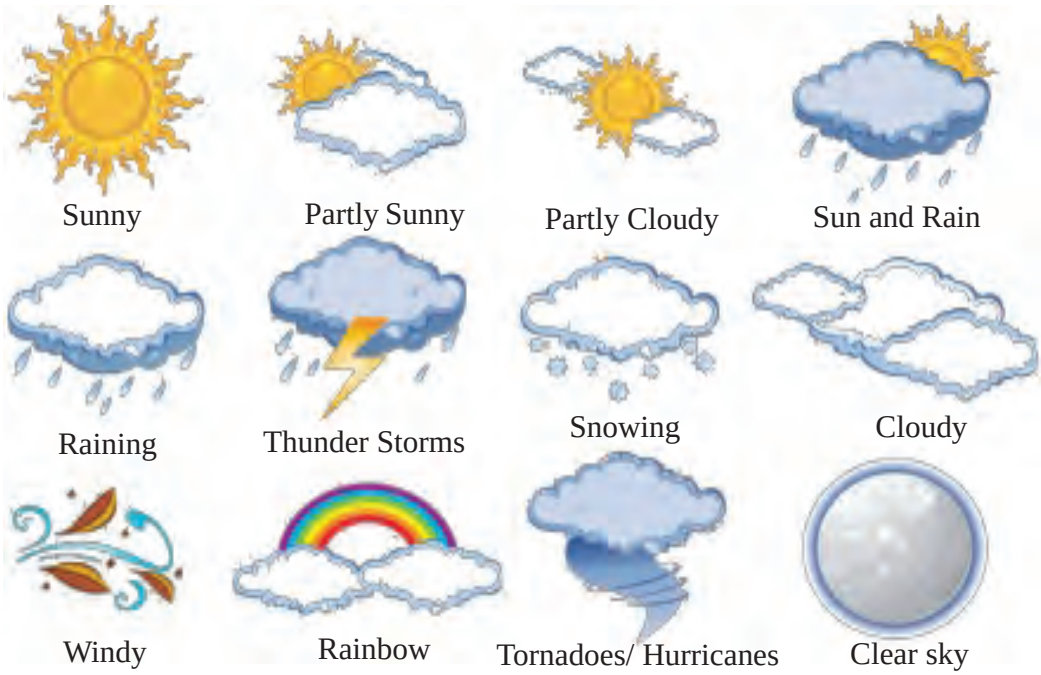


Figure 3.3.2 Weather conditions

Use the information provided in figure 3.3.1- A web page with weather details and figure 3.3.2 - Weather conditions to fill in the blanks of the report on figure 3.3.3 - Weather forecast report.

Weather

Location

Time :

Weather details

Weather symbol

Temperature

Weather condition :

	Morning	Afternoon	Evening	Overnight
Temperature :				
Weather symbol :				
Weather condition:				

Figure 3.3.3 Weather forecast report

You may have not observed all the symbols on figure 3.3.2 but you may have observed some of them. From the given symbols can you identify the symbols of weather conditions that mainly affect Sri Lanka? Note them down.

What are the advantages of listening to the daily weather forecast?

Activity 3.3.2

Let's identify factors that determine the weather

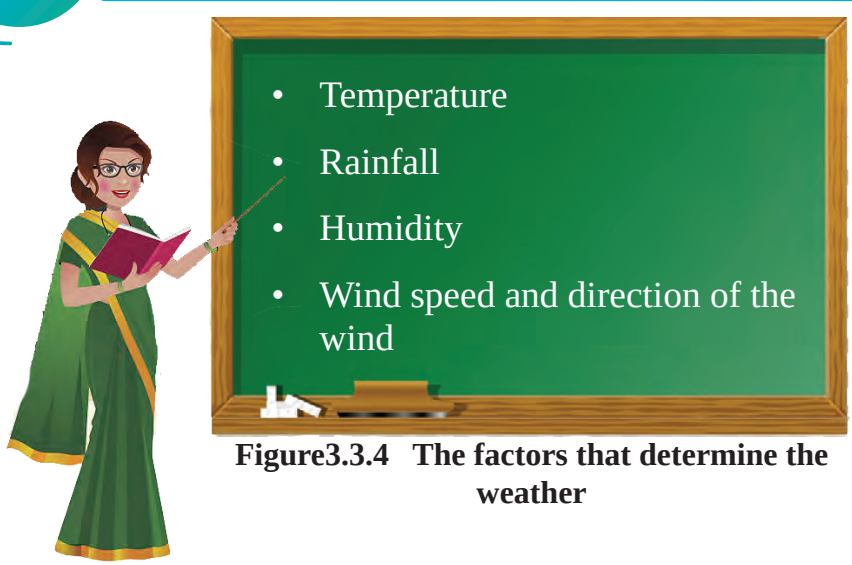


Figure3.3.4 The factors that determine the weather

Together with your friends, write down what you know about each factor given in figure 3.3.4.

Temperature 	Rainfall 
Humidity 	Wind speed and direction of the wind 

Exercise 3.3.1

Let's analyse weather related data

The following table 3.3.1 gives the weather data of a region of Sri Lanka in 1996 - 1997 period. Answer following questions based on that table.

Year	Month	Temperature/ °C		Humidity (%)	Rainfall/ mm
		Maximum	Minimum		
1996	July	30.3	23.5	95	358.1
	August	29.9	23.5	95	123.2
	September	29.9	23.5	95	261.1
	October	30.9	22.9	95	266.2
	November	31.5	22.9	95	153.4
	December	31.9	21.2	94	58.5
1997	January	33.3	20.5	92	0.0
	February	33.4	21.9	92	4.9
	March	34.2	23.5	92	47.9
	April	33.8	23.7	93	109.8
	May	33.1	24.1	93	84.3
	June	31.8	23.5	93	551.6
	July	30.4	23.3	96	579.6

Table 3.3.1

1. Which year and month had the maximum temperature?
2. Which year and month had the maximum humidity?
3. Which year and month had the lowest rainfall?
4. Calculate the average temperature of the month which had the lowest rainfall.
5. What was the humidity of the month which had the lowest rainfall?
6. Which year and month had the maximum rainfall?
7. Calculate the average temperature of the month which had the maximum rainfall.
8. What was the humidity of the month which had the maximum rainfall?

Activity 3.3.3

Let's learn about the climate

Collecting weather data of a respective region for a longer period of time can lead to an understanding of the climate of that region. Generally it requires collecting at least 30 years of weather data. Climate is defined as conditions of the atmosphere at a particular region over a long period of time. Here are some information that helps you to learn more about climate and climatic changes occurring within the global context.

Based on long term weather data (mainly rainfall and temperature), the world is divided into three major climatic zones: Polar zone, Temperate zone and Tropical zone.

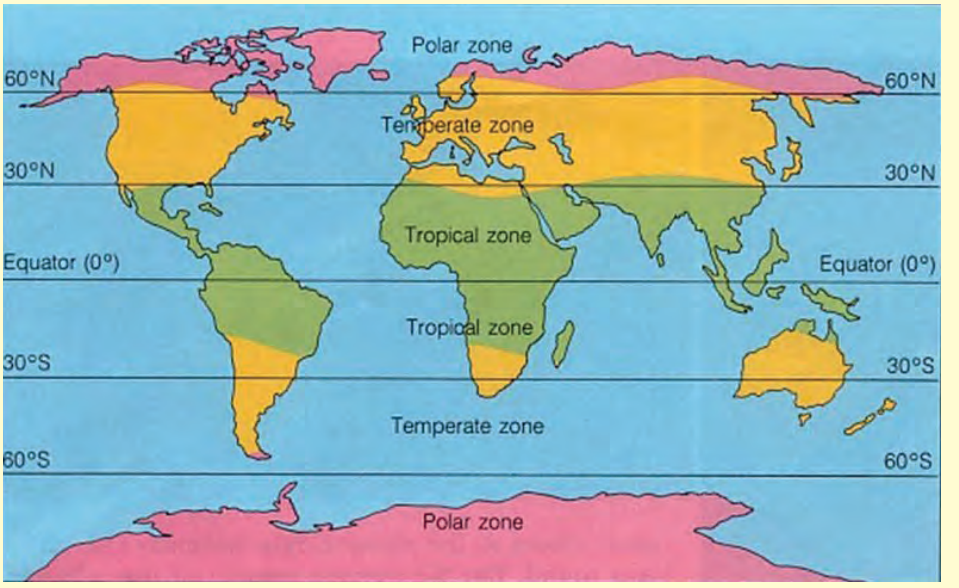


Figure 3.3.5 Climatic zones

Sri Lanka's climatic zone can be described as tropical due to its position near the equator making the country with year-round warm weather moderated by ocean winds and considerable humidity. Climatologists work hard to study on changing climatic patterns, since it is important to understand the changes of the Earth's climate and their effect on living beings.

People who are working on weather and climate related activities are called 'meteorologists' and 'climatologists'.

Have you seen a weather station?

Figure 3.3.6 shows a weather station situated in Sri Lanka.

Figure 3.3.6 A weather station

Activity 3.3.4

Let's make a weather station

Your weather station should consist of a rain gauge, an anemometer, a wind vane, a thermometer and a hygrometer.

Teacher will assign you into groups. Each group has to prepare an instrument with the assistance of the teacher.

Preparation tips for a simple rain gauge

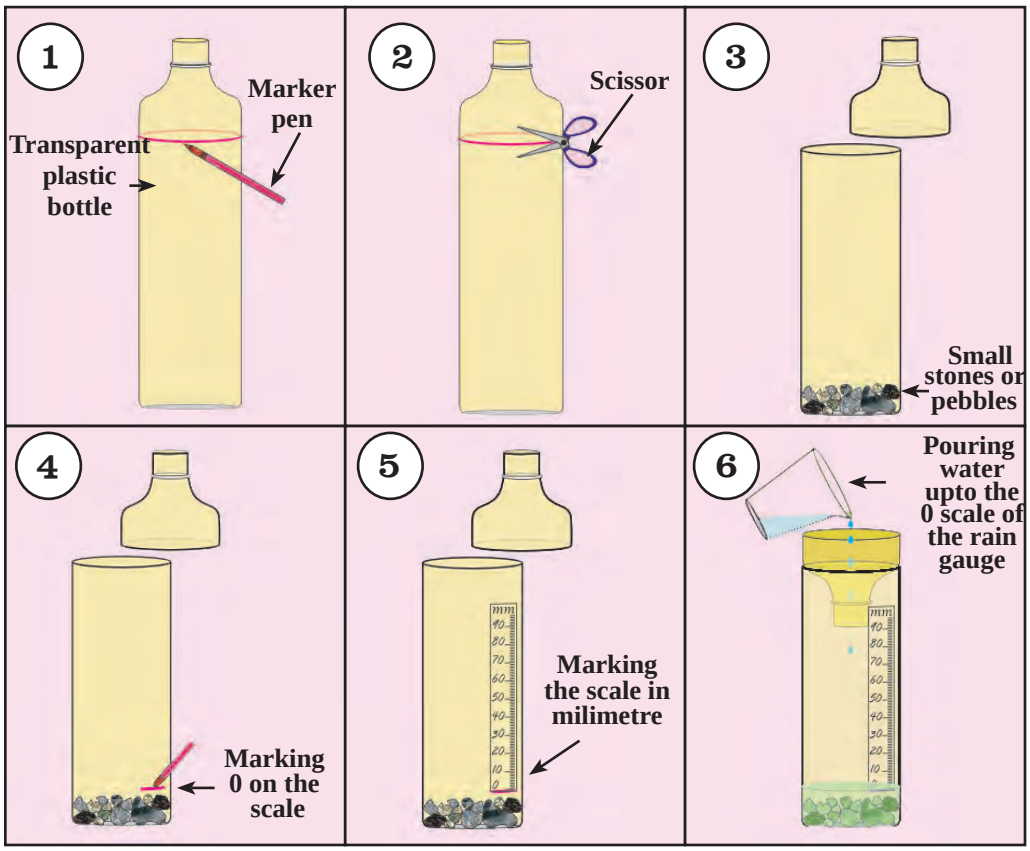


Figure 3.3.7 Instructions for preparation of a simple rain gauge

What you need:

- A transparent plastic bottle with 25 centimetre height (empty drink bottle)
- A marker pen
- A pair of scissors
- Water
- A ruler
- Small stones or pebbles

Follow the instructions given in figure 3.3.7 to prepare your rain gauge.

Points to discuss with friends during the activity

- How to take measurements using the rain gauge?
- What are the suitable places to keep the rain gauge to measure rain?
- How to improve this rain gauge to obtain more accurate readings?

Preparation tips for a simple anemometer

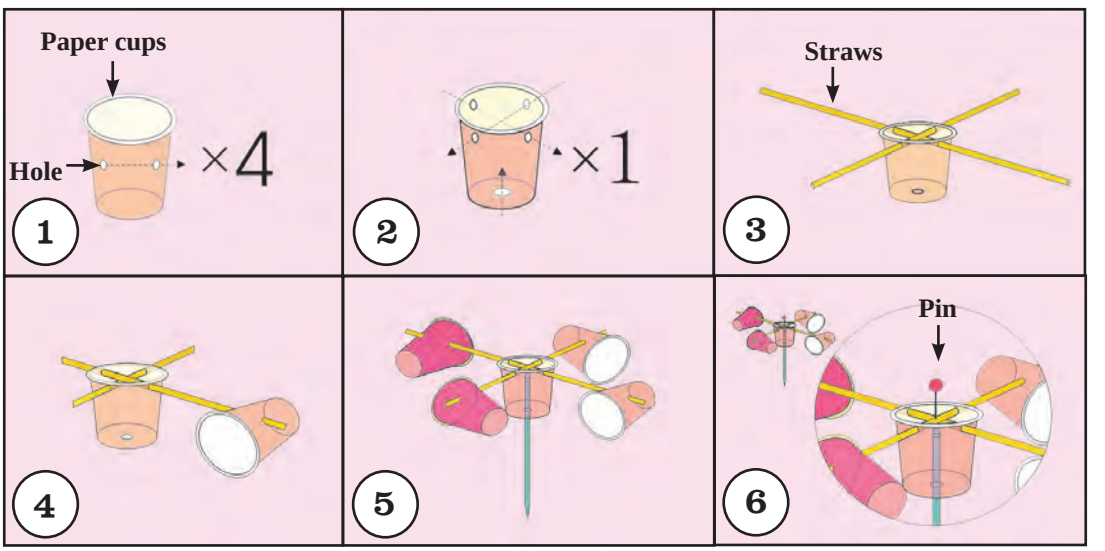


Figure 3.3.8 Instructions for preparation of a simple anemometer

What you need:

- Two straws
- A pencil with an eraser at one end
- Five yoghurt cups or paper cups
- A pin
- An object with a sharp tip for making holes
- An adhesive

Follow the instructions given in figure 3.3.8 to prepare your anemometer.

Points to discuss with friends during the activity

- What is the use of an anemometer ?
- How can you improve the anemometer prepared by you ?

Preparation tips for a wind vane

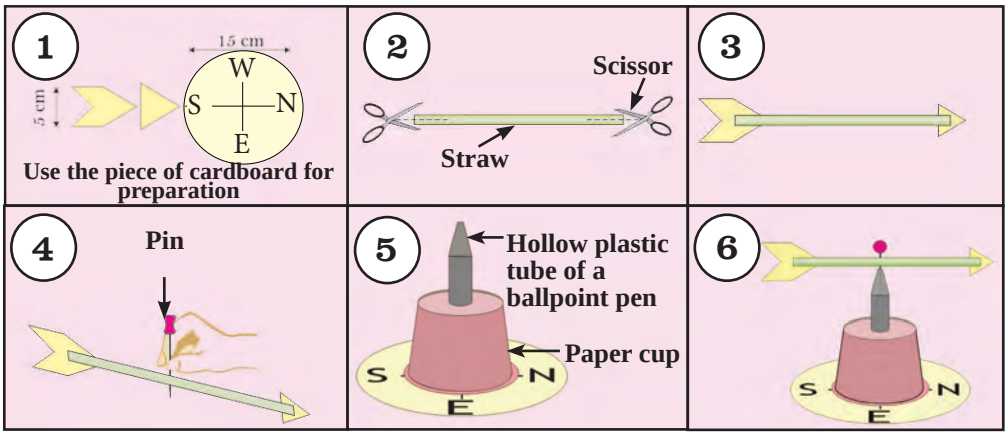


Figure 3.3.9 Instructions for preparation of a wind vane

What you need:

- A piece of cardboard
- A paper cup
- Hollow plastic tube of a ballpoint pen (without ink refill)
- A straw
- A pin
- A pair of scissors
- An object with a sharp tip for making holes
- An adhesive

Follow the instructions given in figure 3.3.9 to prepare your wind vane.

Points to discuss with friends during the activity

- What is the application of a wind vane?
- How can you improve the wind vane prepared by you ?

Preparation tips for a simple thermometer

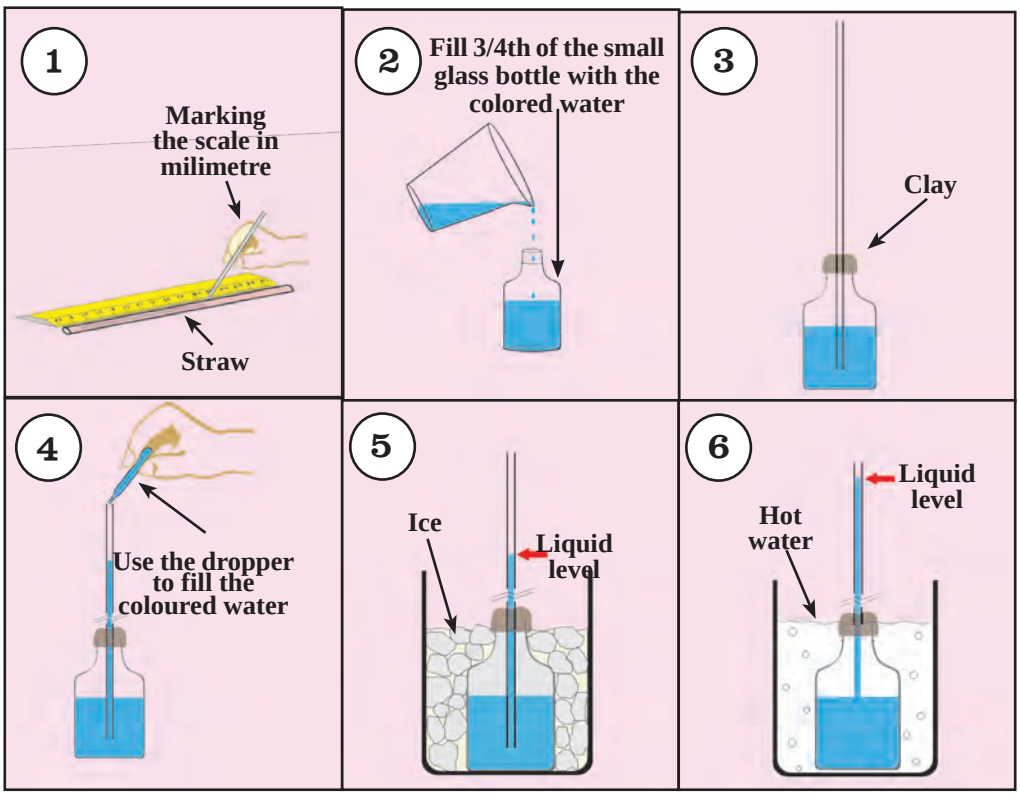


Figure 3.3.10 Instructions for preparation of a simple thermometer

What you need:

- A small transparent plastic bottle
- A transparent thin straw
- Modelling clay
- Food colouring
- Dropper
- Water

Follow the instructions given in figure 3.3.10 to prepare your thermometer.

Points to discuss with friends during the activity

- Why do you think it is important to colour the liquid?
- Observe the liquid level changes in the straw in cold and warm water. What could be the reason for the liquid level changes ?

Preparation tips for a simple hygrometer

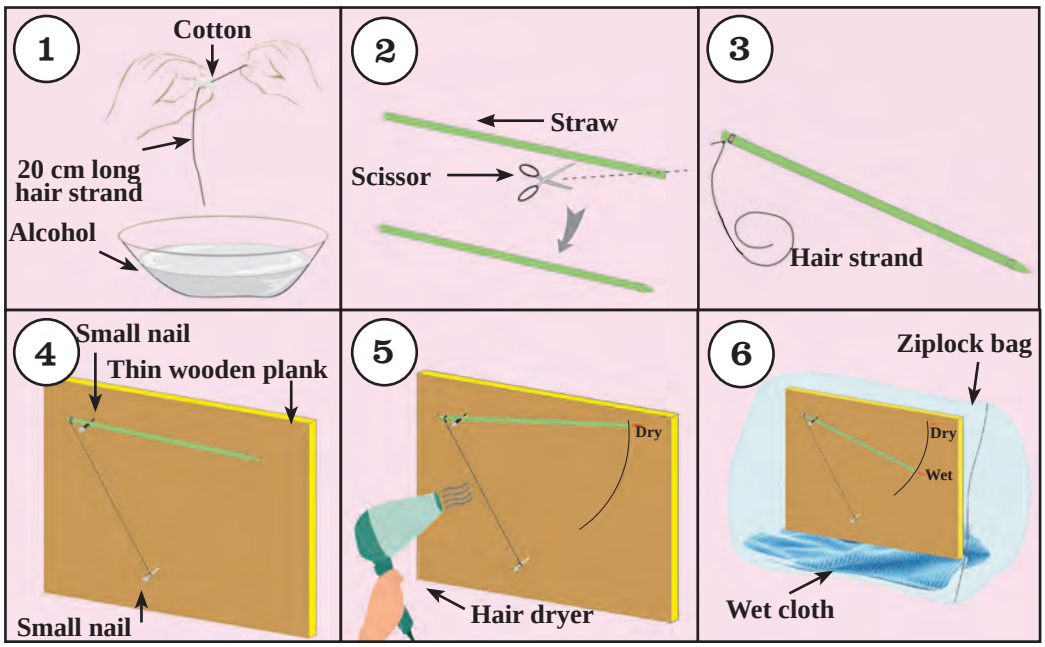


Figure 3.3.11 Instructions for preparation of a simple hygrometer

What you need:

- Alcohol
- A long strand of human hair (about 20 cm long)
- A thin wooden plank (about 25 cm long and 15 cm wide)
- Cotton
- A straw
- A pair of scissors
- A ruler
- Two small nails
- A marker pen
- Glue
- A ziplock bag
- A hammer
- Hair dryer (if available)
- A wet sponge or a piece of cloth

Note : It is necessary to clean the strand of hair using a solution of alcohol prepared by mixing alcohol and water in the proportion of 1:3, with the help of the teacher.

Follow the instructions given in figure 3.3.11 to prepare your hygrometer.

Points to discuss with friends during the activity

- What happens to the length of the hair strand when it is being dried?
- What happens to the length of the hair strand when it is moistened ?
- How to measure humidity (moisture content) using the hygrometer?

Out of the above instruments you have prepared, decide which instruments you can use for your weather station in order to take measurements. Discuss with your teacher.

Activity 3.3.5

Mini-project on measuring weather

- Once the instruments are prepared install a weather station in a suitable place at school and collect weather related data.
- Maintain collected data in a weather journal. Your teacher will explain you how to maintain a weather journal.

Activity 3.3.6

Let's get to know about natural disasters

Collect newspaper articles written on floods, land slides, droughts and lightning strikes occurred due to weather changes affecting people and their properties in Sri Lanka.

» At home, you can collect some articles from newspapers or download them from the internet.

» Try to find at least four incidents occured during last five years. Read them well.

» Get into groups and classify all articles according to the type of disaster. Select the most descriptive article about each natural disaster from the collection. Using them, fill the table 3.3.2.

Incident	Area	Date of occurrence (Month and year)	Causes	Effects (damages to people/ properties/ environment)	Actions taken after the disaster *
1.					
2.					
3.					
4.					

Table. 3.3.2

**Actions taken after the disaster :* The actions taken by the government and other parties to rescue people, resettlement, protect houses and properties and to improve infrastructure in the area.

Why is it important to be aware of natural disasters? Explain briefly.

Natural disasters are the naturally occurring destructive incidents, without the mediation of man, causing harm to human lives, property, environment and the economy.

Activity 3.3.7

Let's identify common natural disasters

The following pictures demonstrate various types of common natural disasters that occur around the world. Choose the most appropriate name from the given list.

Floods Cyclones Land slides Lightning Volcanic eruptions Tsunami
Tornadoes Earthquake Forest fires Snow drifts Drought Rock falls



1. .....
2. .....
3. .....



4. .....
5. .....
6. .....



7. .....
8. .....
9. .....



10. .....
11. .....
12. .....

Some more examples of natural disasters are hurricanes, coastal and glacier erosion and epidemics. The way that natural disasters occur and their effects may differ from region to region and from country to country. Mainly, natural disasters occur due to weather and climatic changes. Human activities also trigger some natural disasters.

Out of the above mentioned disasters, can you identify the most common natural disasters in Sri Lanka ?

Sri Lanka is mainly affected by weather-related events such as cyclones, floods caused due to monsoonal rain, droughts, landslides and lightning strikes. Moreover, coastal erosion, epidemics, are also experienced.

Activity 3.3.8

Matching Game

Match the given natural disaster in part A with the most relevant definitions from part B.

Part A	Part B
Landslides	1. The dry condition that prevails for a long period in a certain area as a result of the delay in rainfall for a particular period
Tsunami	2. An overflow of water, when a large mass of water is collected in a small period of time in rivers, canals, streams, reservoirs and other natural water ways
Cyclones	3. Sliding of a large portion of the soil located at a higher elevation downwards along a slope with rocks, gravel and soil lumps
Droughts	4.The hard blowing wind while spinning fast in a swirl
Lightening	5. Large waves that travel fast towards the coast, which are formed due to earthquakes, land slides, or volcanic eruptions occur in the sea bed
Floods	6.Electrostatic discharge (spark) occurs, in the atmosphere accompanied by thunder, which typically associated with thunderstorms