Elementary Science

Class Four

National Curriculum and Textbook Board, Bangladesh

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Elementary Science

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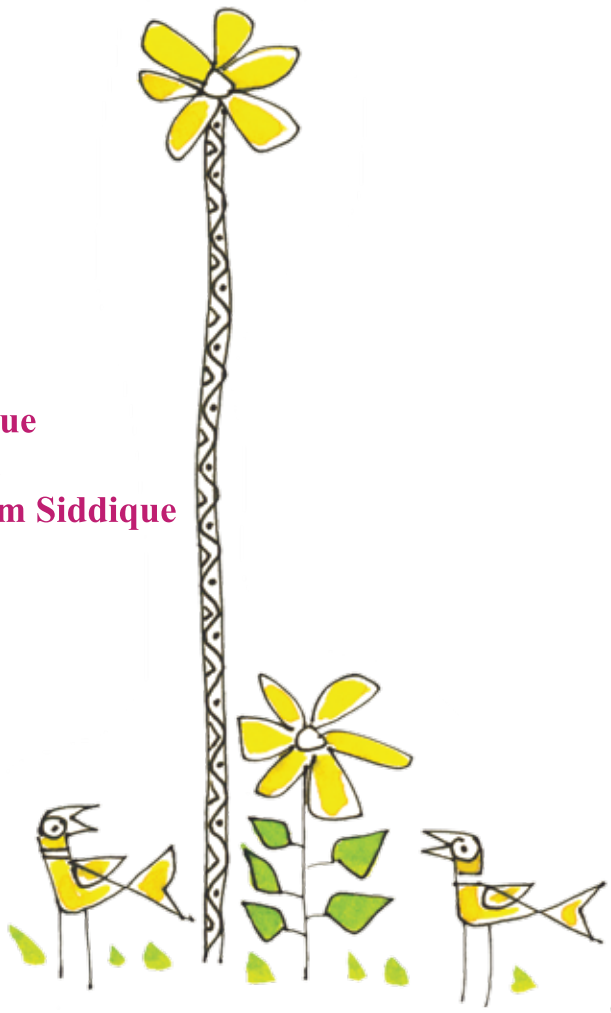

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Preface

Children are great wonders. There is no end to the thinking about their world of wonder. They are a subject of contemplation for educationists, scientists, philosophers, child specialists and psychologists. The fundamental principles of child education outlined in the National Education Policy 2010 have been defined in the light of these contemplations. The curriculum for primary education has been revised to develop a child on the potentials of their innate amazement, unbounded curiosity, endless joy and enthusiasm keeping in view the all-round development of children's potentials. The aims and objectives of primary education were modified in the revised curriculum of 2011.

Children have different objects around them. Every moment various events are taking place in nature. Rainbow in the sky, trees, birds, flowers, the morning sun, the star studded night sky - all are of profound joy and endless amazement. This feeling of joy by a learner awakens in him/her the curiosity and inquisitiveness to ask questions on different objects and events he/she observes. The revised curriculum has due importance to the realisation that the aim of science education is to develop the scientific attitude among the learners. Two fundamental streams are very important in **science education.** One is the acquisition of knowledge and the other is raising questions, experimentation, observation and participation through testing of information and theories. These two streams are complementary to each other. One of the objectives of the revised curriculum is to maintain consistency among different branches of science as well as between science and technology.

With a view to developing human resources capable of leading during the 4th industrial revolution, Mr. Sajeeb Wazed Joy, the Information and Communication Adviser of Honorable Prime Minister Sheikh Hasina, proposed to include coding in textbooks for the primary level learners. In order to implement that proposal, National Curriculum and Textbook Board included text about coding as an extended part (due-part) in the year 2022 in the Primary Science textbooks for grade 3, 4 and 5 learners. It has been included in the main textbook from the year 2023.

To make the young learners interested, enthusiastic and dedicated, Honorable Prime Minister Sheikh Hasina, instructed to change the textbooks into four colours, to make them interesting, sustainable and to distribute free of cost since 2009. The textbooks of all students of Pre-primary, Primary, Secondary, Ibtedaie, Dakhil, Dakhil Vocational and S.S.C Vocational levels are being distributed free of cost across the country which is a historical initiative of the present government.

My sincere acknowledgement and thanks to all who helped in different stages of composition, editing, rational evaluation, printing and publication of the textbook. Though all cares have been taken by those concerned, the book may contain some errors/lapses. Therefore, any constructive and rational suggestions will be highly appreciated for further improvement and enrichment of the book. We will deem all our efforts successful if the young learners for whom it is intended find it useful to them.

Professor Md. Farhadul Islam
Chairman
National Curriculum and Textbook Board, Bangladesh

Major Features of the Revised Primary Science Textbooks

(1) User-friendly

- Learning contents, illustrations and text presentations are considered taking into account the developmental stage of pupils, which emphasize mainly on the conceptual development rather than rote learning.
- Enquiring of pupils' prior knowledge and experience are tried to address in the lesson
- Grade fitting simple texts and child friendly description
- Clear titles, subtitles, and large number of illustrations and photographs
- Abstract things of science are portrayed with pictures/photographs as well as proper description.
- Introduction of characters and symbols to make lesson easy-to-understand & attractive for the children
- New scientific terminologies used in each chapter are highlighted with coloured and bold letters.
- Addition of glossary at the end of the textbook

(2) Emphasis on problem-solving based learning

- The key questions highlighted as the core points of teaching learning in each lesson
- Experiment related alternative equipment/teaching aids are suggested
- Basic layout of the textbook follows the sequence of problem solving approach.
- Learning activities aimed at the acquisition of scientific process skills necessary for children to solve the problem

(3) Planned activities and experimentation

- Introduction of a variety of experiments, demonstration, observation and investigation to promote the scientific attitude of the pupils
- Introduction of the discussion activities to foster communication skills, expression ability and positive attitude of the pupils
- Teaching aids are suggested in consideration with the relevance of the lesson outcomes and the availability.

CONTENTS

Characters and symbols

1) Characters


Keya


Kabbo

Keya and **Kabbo** will give you some tips or clues about your learning of science. Let's learn Science together!

2) Symbols


Activity: Let's observe, investigate and experiment!


Discussion: Let's discuss with classmates!


Caution: Let's work carefully to keep ourselves safe!

2023

Chapter 1

Living Things and Environment

1. Living things in the environment

We observe different living and non-living things and events around us. All those living things and objects make our environment. There are different types of environments such as natural and man-made environment. Different living things live in different environments. In this chapter, we shall learn about the requirements of living things for survival.

natural environment

man-made environment

(1) Requirements of living things for survival

QUESTION : What do living things need to survive?

Activity : Needs for living things

What to Do :

1. Make a table like the one shown below.

what living things need to survive

2. In the table above, make a list of what living things need to survive.
3. Share your ideas with your classmates.

If I cover my nose and mouth with a hand, I cannot breathe.

When I feel thirsty, I drink water.

Summary

Living things need food, habitat, shelter, water, and air to survive.

Food

Animals have to take food to get energy and nutrition for survival. They get food from plants or other animals in the environment. Plants also need energy and nutrients but they do not take food as animals do. Plants can make their own food by themselves.

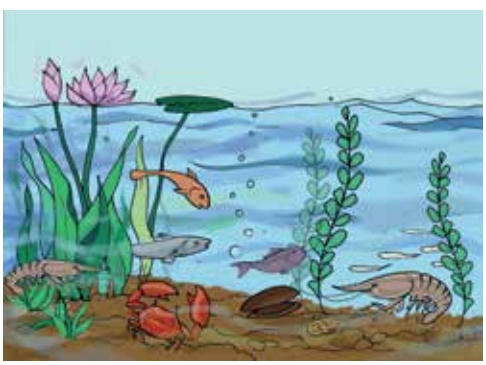
Habitat and Shelter

All living things need habitats. A **habitat** is a special place where plants grow and animals live in. Animals also need shelter. A **shelter** is a place where animals can be safe. Shelter provides animals with protection from other **predators** or adverse weather conditions such as rainfall and storm. Some animals such as birds make nest in the trees for shelter.

Birds make nests in trees for shelter

Water

No living things can survive without water. Plants use water when they make food. Animals drink water to digest their food. Many plants and animals live in water.

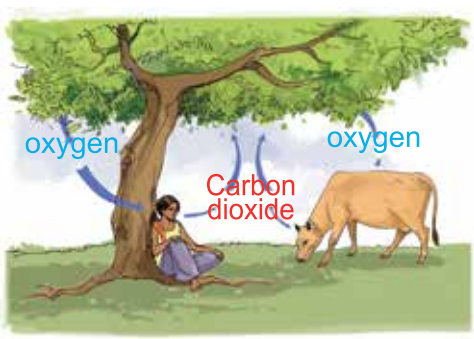


Many living things live in water

Air

Air is very important for living things. Plants use carbon dioxide from air and give off oxygen into air when they make food. Animals and plants both use the oxygen from air and give off carbon dioxide for breathing.

Living things get all the necessary things from the environment for their survival.



Air is important for living things

(2) What plants need to make food

QUESTION : What do plants need to make food?

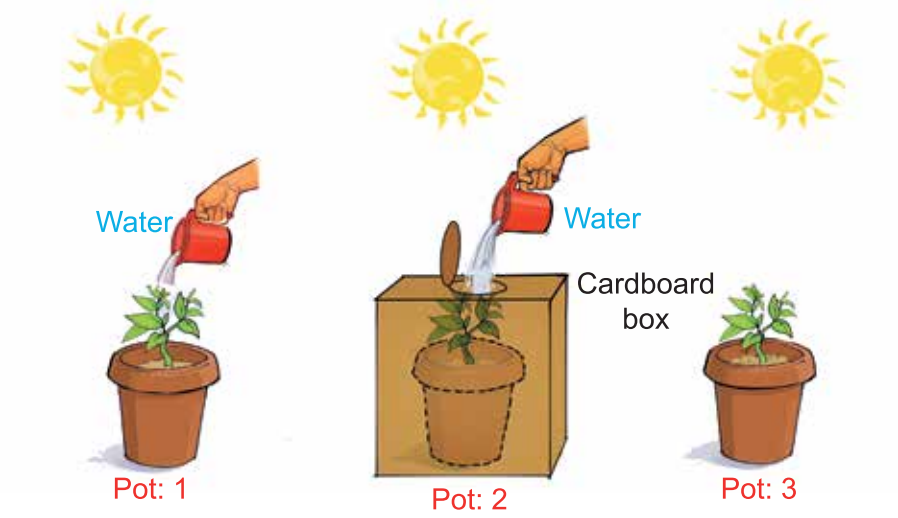
Activity : Necessary elements for the growth of plants

What to Do :

1. Make a table like the one shown below:

Pot	Condition	Your observation
1	There are sunlight & water	
2	There is water but no sunlight	
3	There is sunlight but no water.	

2. Prepare three plant pots with gram seedlings.
3. There is sunlight but no water. Set up three plant pots like the figures below. Put the pots 1 and 3 in the sunlight but cover the pot 2 with a cardboard box.



4. Water the pots 1 and 2 every day but do not water the pot 3.
5. After a couple of weeks, compare the growth of seedlings in each pot.
6. Record your observation in the table.
7. Share your idea with your classmates.

Result

Pot	Condition	Your observation
1	There are sunlight & water	the seedling is growing well.
2	There is water but no sunlight	It is not growing well. The colour of leaves and stems becomes yellow.
3	There is sunlight but no water	the seeding has died.

Discussion

◆ **Discuss the following points with your classmates based on your observation.**

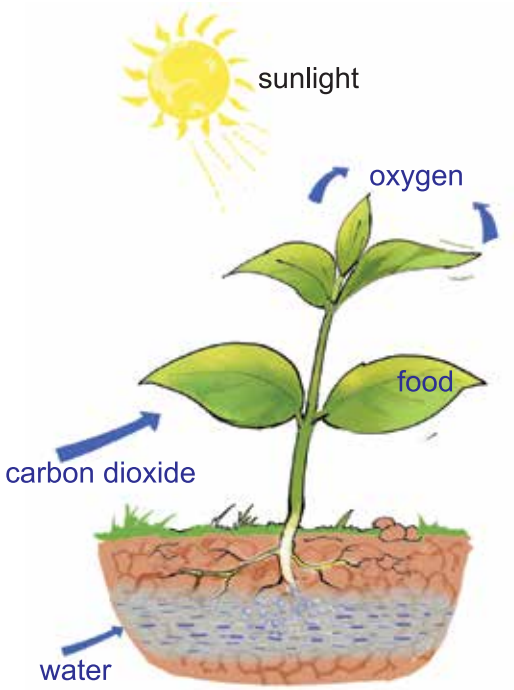
(1) What condition is different between the pot 1 and pot 2?
(2) Which seedling has grown well - pot 1 or pot 2? Why ?
(3) What condition is different between the pot 1 and pot 3?
(4) Which gram has grown well - pot 1 or pot 3? Why ?
(5) What elements do plants need to grow?

Summary

Plants cannot live without sunlight and water.

Plants make food using sunlight and water. They also use carbon dioxide from air to make food. They use the food they make in order to get the energy for survival and growth.

Plants need sunlight, water and carbon dioxide in order to make food.



making food by plants

2. Human dependency on plants and animals for food

Human need food to survive. They eat plants and other animals as food to get energy.

QUESTION : How do human depend on plants and animals for their food?

Activity : Sources of our food

What to Do :

1. Make a table like the one shown below:

Food	
Plant food	Animal food

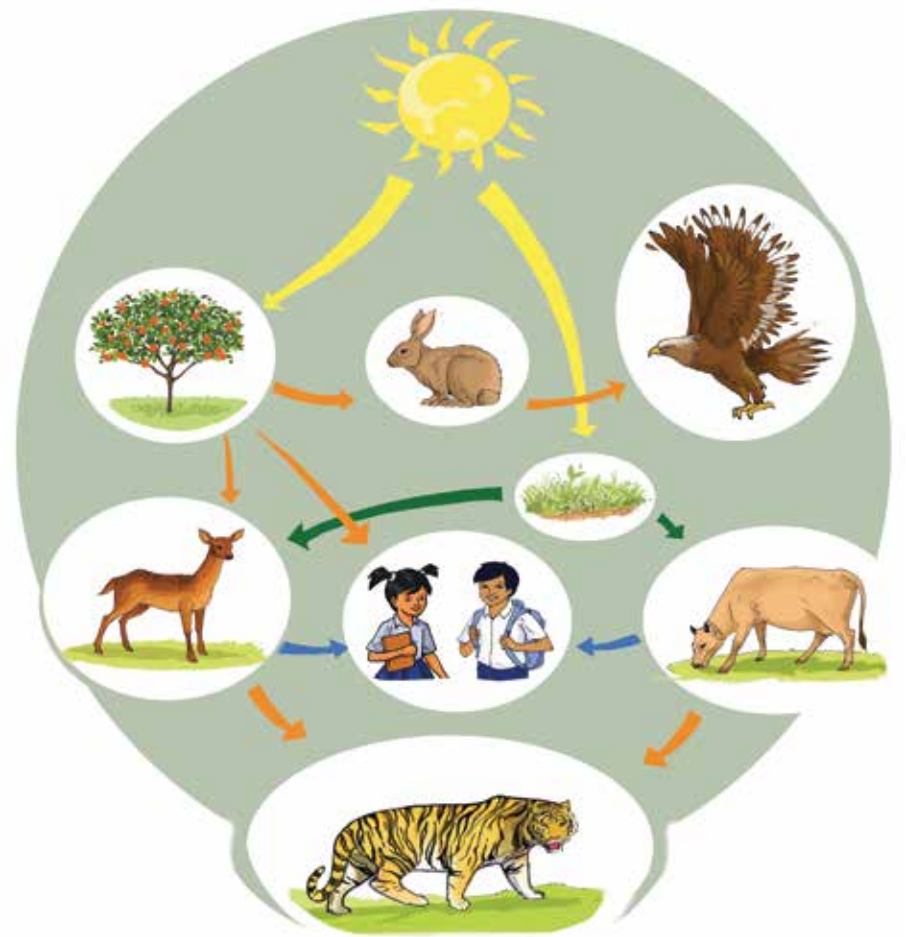
2. Make a list of food from the picture below, and classify them into plant and animal group in the table above.
3. Share your idea with your classmates.

Summary

Human eat different kinds of plants and animals to get energy. Human directly or indirectly depends on the environment for their food.

Energy passing through food

All living things need energy to survive and grow. Plants use the sunlight (light energy) to make their own food. This food provides plants energy they need. Plants get energy from the sunlight. Animals cannot make food by themselves. They must eat plants or other animals as food to get energy. Animals get energy from other living things. Like this, energy can pass through food from the Sun to plants, from plants to animals in the environment.



energy flow from the Sun to living things

3. Changes in the environment

QUESTION : What causes environmental changes?

Activity : How has the environment been changing?

What to Do :

1. Make a table like the one shown below.

causes of changes in environment

2. Compare two pictures below, and make a list of causes of changes between the two environments in the table.
3. Share your ideas with your classmates.

before development

after development

Discussion

◆ **Based on the table you have made above, think about the following points.**

1. Who has mainly changed the environment?
2. Why are they changing the environment?

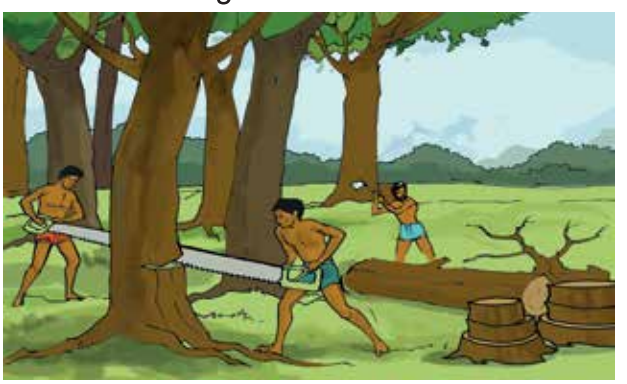
2023

Summary

The causes of environmental change

Environmental changes because of natural disasters and human activities. natural disaster such as **drought**, flood, storm, earthquake change the environment. Humans have been cutting down trees to use as fuel or building materials. They have cleared forests to cultivate crops or for livestock feed and to build houses, roads, and factories. Human is also changing the environment to get natural resources.

human clear forests to build roads

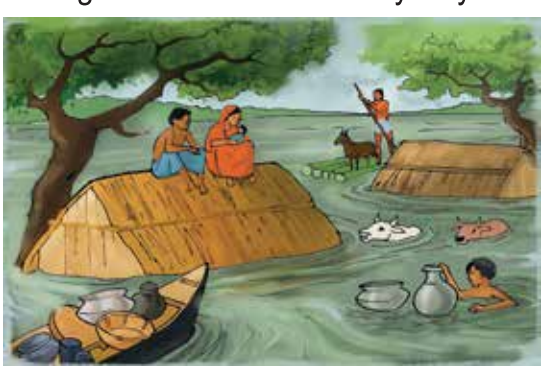


humans cut trees for fuel and furnitures

storm changes the environment

The effects of environmental change

The environmental change can affect the changes in rainfall and temperature. The change in rainfall and temperature may cause different types of natural disasters such as flood, drought, storm and landslides. The natural disasters cause serious damage to human life in many ways and to the habitats of all living things.



flood

drought

EXERCISES

1. Fill in the blanks.

1) A place where animals can be safe is called _____.
2) Living things get all the necessary things from _____.
3) Plants need _____, water and air in order to make food.
4) Human changes the environment to get _____.

2. Put a tick mark (✔) on the correct answer.

1) What do plants give off when they make food?

a. oxygen b. water vapors
c. carbon dioxide d. nitrogen

2) Where do humans directly get energy to survive?

a. air b. water
c. soil d. food

3. Short Answared Questions:

1) What kinds of natural disaster may change the environment?
2) What do living things need to survive?
3) What do plants need to make food?

4. Descriptive Questions:

1) How humans are changing the environment?
2) What will happen to the green grasses if we put a brick on them for some days? Why?
3) How are living things being harmed by environmental changes?
4) What are the differences between habitat and shelter?

5. Using the words in the box below, explain how the energy can pass through food from the Sun to Humans. You can use arrows to show the energy flow.

plants	the Sun	human	animals

2023

Chapter 2

Plants and Animals

1. Differences between plants and animals

Plants and animals are both living things. Can you see any differnces? How can we differentiate between plants and animals?

QUESTION : What are the differences between plants and animals?

Activity : Characteristics of plants and animals

What to Do:

1. Make a table like the one shown below.

Questions	Plants	Animals
How do they get energy?		
What body parts do they have?		
How do they move from place to place?		
How do they respond to a stimulation?		
Anything else?		

2. Make a list of the characteristics of plants and animals in the table.
3. Differentiate plants from animals comparing their characteristics.
4. Share your ideas with your classmates.

Can you remember the characteristics of plants and animals?

An animal has legs, wings or fins to move but plants are rooted in the ground.

Summary

Plants differ from animals in many aspects.

Making food

Plants can make their own food by themselves. Animals can not make their own food and are dependent on plants and other animals for food.

Plants can make food by themselves

Animals depend on plants and other animals for food

Different parts of the body

Plants have body parts such as roots, stems and leaves. Animals have body parts such as limbs, fins or wings. Some have fur or some have scales or feather. Most of the animals also have eyes, ears, mouth and nose to keep them alive.

Movement

Plants generally are rooted in one place and do not move from place to place on their own. Most of animals have the ability to move freely by using limbs, wings or fins.

Animals can move freely

Plants are rooted in soil

2. Living things in their environment

(1) Plants in the environment

Plants grow in many places. Some plants grow on soil and some grow in or on water. Some plants grow both on soil and in water.

QUESTION : Where do plants grow in the environment ?

Activity : Where plants grow ?

What to Do :

1. Make a table like the one shown below.

Name of plant	Where do you find it?

2. Go out of the classroom with your exercise books.
3. Find plants around your school and write the name and the place of plants you have found in the table.
4. Share your ideas with your classmates.

Summary

Habitat of Plants

Some plants like mango, berry, jackfruit etc. grow in bright sunny places. We can find some plants like mosses and ferns in shady and moist places. Water hyacinth and Water lily are found on and inside water. Kalmi, Helencha etc. grow both in water and on the soil.

mango tree in a sunny place

water hyacinth on the water

moss on the wall

kalmi

Sundarban

Some plants grow in saline soil. Sundarban is such kind of saline soil environment in Bangladesh. The plants grow in this environment are different than those of other regions. These plants have **pneumatophore** for breathing. Sundori, Goran, Kewra are the examples of such kind of plants.

There are some plants, which grow on other big trees such as Shornolota, Rasna etc.

(2) Animals in the environment

Animals live in many places such as land, water, trees and hills etc. Which animals live in which places?

QUESTION : Where do animals live in the environment ?

Activity : Living places of animals

What to Do :

1. Make a table like the one shown below.

Name of animal	Where do they live?

2. Seeing the picture below, write the names and the living places of different animals in the table.
3. Share your ideas with your classmates.

Summary

Habitat of animals

Different animals live in different habitats. Some animals such as rats, rabbits, and porcupine etc.live in burrows. Besides, some animals such as, beetles, ants and earthworm etc.live in the soil.

rabbit lives in burrows

underground habitate of different animals

Animals like jackal, mongoose live in bushes or woods.

Birds and squirrels make their nests in trees or live in tree holes. Some insects such as butterflies and bees also use trees as their habitats.

We find fish and shrimps in the water. Frogs, turtles and crocodile can live both on land and in water.

fishes, turtles live in water

birds make nest in trees

(3) Diversity of plants and animals based on habitat

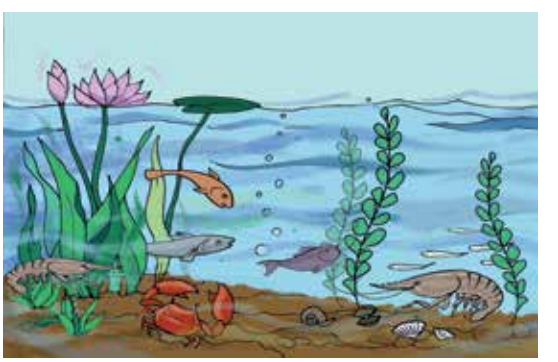

desert habitat

We have already come to know that plants and animals live in different habitats in the environment. There are various types of habitats on Earth such as land, wetland, ocean, desert, forest and polar region. Different habitats have different characteristics.
Plants and animals adapt themselves in different ways to survive in those different habitats.

Desert Habitat

A desert is an extremely dry place with very little water and rain. Some spiny shrubs such as Cactus grow in this environment. The stem and leaves of these plants are succulent and its smooth outermost surface helps to retain water. Different types of animals such as snake, lizard, camel live in desert. A camel stores fat in its hump. This stored fat helps it to survive longer period without water or food in desert environment.


forest habitat


wetland habitat

Forest Habitat

A forest is a place with many trees and bushes grown densely in the natural process such as the Sundarbons, and Sal forest. Forest is also used as the habitat of various animals like Royel Bengal Tiger, Forest Cats, Deer, Monkey, Birds etc.

Wetland Habitat

Pond, cannel, wetland etc. are wetland habitat. Water lily, Water hyacinth, dack weed and other aquatic plants grow in wetland. Mussels, shrimps and fishes etc. are the examples of animals of wetland habitat.

Ocean Habitat

Ocean is a large reservoir of saline water. Ocean is used as a habitat of different kinds of animals and plants. Whales, dolphins, fishes and crabs etc. are the examples of animals living in the ocean. Among the plants, there are algae and sea weeds.

ocean habitat

Polar Habitat

Polar region is the extremely cold and ice covered place of earth which is situated at the furthest northern hemisphere and southern hemisphere. Pines and few grasses grow in those regions. Polar bear, Seals and Penguin etc. live in that area. To protect themselves from the extreme cold weather, these animals have very thick skin and are covered with fur.

polar bear has thick fur

Discussion

◆ **Which environment do plants and animals live in?**

1. Make a table like the one shown below.

Habitat	Plants	Animals
Desert		
Forest		
Wetland		
Ocean		
Polar		

2. Make a list of plants and animals that live in each habitat in the table.
3. Share your ideas with your classmates.

2023

3. The effects of environment on living things

The positive effects of environment on plants and animals

Many kinds of plants and animals live in the environment. Plants and animals get water, food and shelter from the environment to survive.

Tali palm is an endangered plant

The negative effects of environment on plants and animals

The environment is being changed due to some natural causes such as flood, storm, **drought** etc. Human activities have also been changing the environment drastically. The environmental changes cause the destruction of the habitats of plants and animals. Therefore, plants and animals might die or some of them might become extinct such as Dodo bird and Tasmanian tiger. In Bangladesh, Javan rhinoceros, King vulture and Lal shir became extinct. Tali palm tree and the Royal Bengal Tiger are endangered at present condition.

Royal Bengal Tiger is an endangered animal.

extinct Javan rhinoceros

Discussion

◆ **Who are responsible for environment change?**

1. Make a list of the causes of environmental changes in the table shown at your right.
2. Share your ideas with your classmates.

natural causes	human causes

2023

EXERCISES

1. Fill in the blanks.

1) The part of an environment where a plant or an animal lives is called _____.
2) Different plants and animals live in different _____.
3) A _____ is a place with many trees that grow densely.
4) An _____ is a big reservoir of salty water.
5) A camel stores _____ in its hump.

2. Put a tick mark (✔) on the correct answer.

1) Where does a whale live?
   a. river b. ocean
   c. desert d. forest
2) How can the thick fur help polar bears?
   a. keep them warm b. keep away some animals
   c. Keep them cool d. help them swim
3) Which one is extinct animal?
   a. Dodo bird b. Royel Bengal Tiger
   c. Dove d. Polar bear

3. Short Answered Questions:

1) Write three differences between plants and animals.
2) What causes environment change?
3) Write the names of four habitats of plants and animals.

4. Descriptive Questions:

1) How do cactus and camel survive in the desert?
2) Why do some plants and animals become extinct?
3) Which region does Penguin live in? What are the characteristics of that region?

5. Match the words from the left column with the words from the right column.

whale	desert
water hyacinth	pond
lizard	forest
monkey	Ocean

Chapter 3

Soil

1. The Importance of Soil

Soil is the loose covering of Earth's surface. Plants and animals use soil as their habitat. Plants grow on soil. Animals eat plants to get energy. People use soil in their life in different ways.

QUESTION : Why is soil important in our life?

Activity : The use of soil

What to Do :

1. Make a table like the one shown below.

uses of soil

2. Make a list of uses of soil in our life in the table.
3. Share your ideas with your classmates.

Summary

There are different uses of Soil. People use soil for different purposes.

Agriculture

People use soil for growing plants. Soil provides necessary water and nutrients for plants. People grow vegetable and crops for food they need to live on.

growing crops in soil

Building

People make houses and buildings on soil. Soil can be used for making building materials such as bricks or concrete.

Arts and Crafts

Soil is used for making pottery that can create kitchen goods such as pots, vases, bowls etc. People also use soil in making artwork for interior decoration and for exhibition.

pottery

Landfills

A lot of garbage that people throw away goes to a landfill. **Landfills** are areas where garbage is placed on the land. Most of trash that we throw away ends up in a landfill. Sometimes garbages have placed in a specific area or build it within the soil.

burying trash with soil

2. Growth of Soil Fertility

We learnt that plants need air, water and sunlight to grow. What else do they need to grow well?

QUESTION : How can we grow plants well?

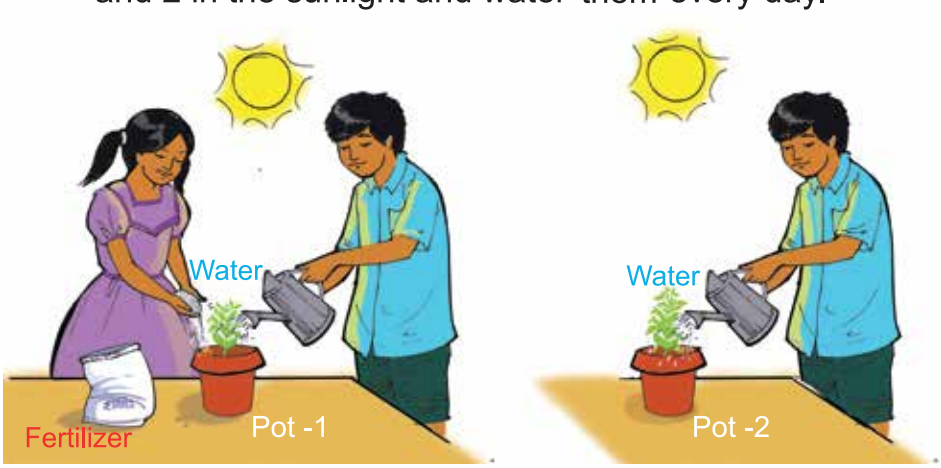
Activity : The need of plants to grow well

What to Do :

1. Make a table like the one shown below.

pot	conditions	data through observation
1	Plants with fertilizer	
2	Plants without fertilizer	

2. Prepare two similar plant pots with gram seedling.
3. Add fertilizer to the pot 1, but do not add fertilizer to the pot 2.
4. Set up two plant pots like the figures below. Keep the pot 1 and 2 in the sunlight and water them every day.



5. After a couple of weeks, compare the growth of gram seedlings in each pot.
6. Record your observation in the table.
7. Share your ideas with your classmates.

Summary

We found that plants grow well in soil that contains fertilizers. Fertilizers include the elements that are most important in plant nutrients. Plants need nutrients to grow and thrive. The soil that contains more nutrients necessary for plants is more fertile. Soil fertility is the capacity of soil to grow crops. The followings are some good ideas on how to make soil fertile.

(1) Using Fertilizer

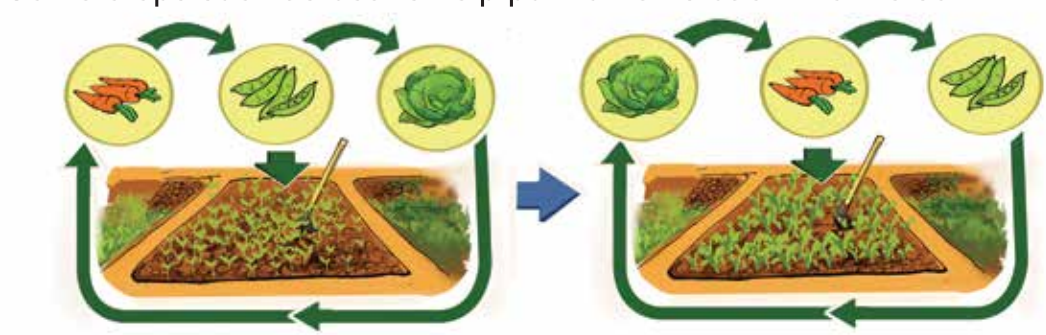
Farmers apply fertilizers in soil to produce crops. The fertilizer can help in restoring lost soil nutrients. Fertilizer can be divided into two groups: organic fertilizer and inorganic fertilizer. Cowdung and compost are organic fertilizers and urea and TSP are inorganic fertilizers.

organic fertilizer : compost

inorganic fertilizer : urea

(2) Rotating Crops

If the same crop is cultivated year after year in the same field, crop uses up some of nutrients in the soil. Crop rotation helps maintain soil fertility. Some crops such as beans help put nutrients back into the soil.



lost nutrients in soil can be replaced by rotating crops

3. Soil Pollution

Soil pollution happens when people put harmful materials directly or indirectly into the soil.

QUESTION : What causes soil pollution?

Activity : The causes of soil pollution

What to Do :

1. Make a table like the one shown below.

The causes of soil pollution

2. Make a list of the causes of soil pollution in the table above.
3. Share your ideas with your classmates.

Discussion

◆ **What can we do to prevent soil pollution?**

1. Share your ideas with your classmates on how we can prevent soil pollution.

Summary

Causes of Soil Pollution

Soil is polluted by different human activities. As for examples–1) littering garbage and domestic waste on the land which do not decompose, 2) the use of pesticides or herbicide for agricultural activities, and 3) leakages of oil or harmful materials from factories to the land.

littering garbage on the land

Effects of Soil Pollution

Soil pollution harms living things and destroys their habitats and the nature. Soil pollution reduces soil productivity. Crop grown in polluted soil may have harmful things. Soil pollution causes diseases in both humans and many other animals.

pesticide spraying in paddy field

How to Prevent Soil Pollution

Here are the good practices that we can do to prevent soil pollution: 1) take out garbage in specific places, 2) reduce the use of materials which are not decomposed in the soil, reuse and recycle something and 3) use organic fertilizer such as composts in the crop field.

picking up trash

Conservation of Soil

Soil conservation is a protection of soil from erosion or the maintenance of soil fertility. **Soil erosion** occurs when top soil is removed by wind and water. It results in the loss of fertile soil and reduces the ability of holding water. Plants play an important role in preventing soil erosion by their roots. We can prevent soil erosion by planting trees, and growing grasses on land.

planting trees

EXERCISES

1. Fill in the blanks.

1) The loose covering of Earth's surface is called _____.

2) _____ happens when people introduce harmful materials into the soil.

3) Compost is an _____ fertilizer.

2. Put a tick mark (✔) on the correct answer.

1) What is the cause of soil pollution?

a. littering trash b. picking up trash
c. using composts d. recycling

2) How can we maintain soil fertility?

a. planting the same crop b. rotating the crops
c. watering the crops d. spraying pesticide

3. Short Answer type Questions:

1) Write five uses of soil in our life.
2) What do plants need to grow?
3) What are the ways to maintain soil fertility?

4. Descriptive questions:

1) How can we prevent soil pollution? Explain.
2) Why is soil important to living things? Explain.
3) How can we conserve soil ?

5. Match the words on the left with the word on the right.

causes of soil pollution	crop rotation
prevention of soil pollution	destruction of the nature
soil fertility	littering garbage
effects of soil pollution	putting garbage in spacific place

Chapter 4

Food

1. Sources of food

We need food to survive. We get various foods from plants and animals in the environment.

QUESTION : Which food comes from plants or animals?

Activity : Classification of food

What to Do :

1. Make a table like the one shown below.

food from plants	food from animals

2. Make a list of food from plants and food from animals in the table.
3. Share your ideas with your classmates.

Summary

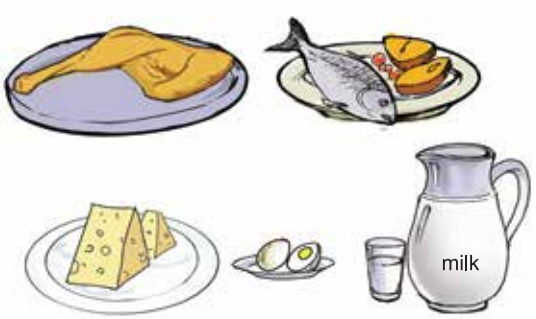
Food from plants

We get most of our food from plants. Plants give us vegetables, fruits, grains and pulses as food.

Food from animals

We also get many kinds of food from animals. Food from animals includes fish, meats, eggs and dairy products.

foods from plants



foods from animals

2. Nutrients

We get various nutrients from food. There are five types of nutrients; carbohydrates, proteins, fats, vitamins and minerals. Along with these nutrients, water is also important to our body.

(1) Vitamins

Vitamins help make our body work properly. Vitamins strengthen our immune system. It supports growth and help our body parts such as eyes and bones do their jobs. There are six types of vitamins such as Vitamin A, B, C, D, E, and K. Vitamin B is made up of different types of vitamins that is called the vitamin B complex. Vitamins are found in foods like vegetables, fruits, meats, fish and dairy products.

food rich in vitamin A

food rich in vitamin B complex

food rich in vitamin C

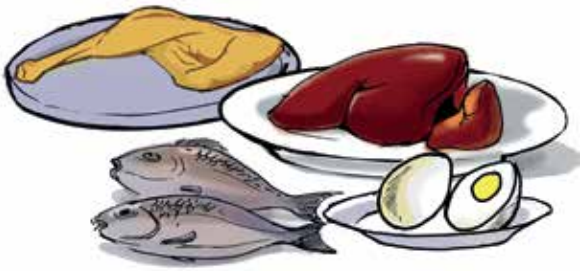
Now, we will learn about different types, sources, functions and the diseases caused by deficiency of Vitamins

types	sources	functions	diseases caused by deficiency of vitamin
Vitamin A	carrots, spinach, pumpkin, small fish, milk, egg yolks, etc.	It helps for proper vision, healthy skin, strong teeth and healthy immune system	night blindness
Vitamin B complex	whole-grains, dairy products, fish, liver, green vegetables, beans, etc.	It helps body make energy	beriberi, mouth ulcer, anemia
Vitamin C	fruits such as guava, emblic, oranges, lemons and vegetables like tomatoes , cabbage and broccoli etc.	It strengthens immune system, and keeps body working and developing properly	scurvy, disease of gum
Vitamin D	egg yolks, fatty fish, sunlight, etc.	It is important in the growth and maintenance of strong bones	rickets, Osteomalacia
Vitamin E	vegetable oils, almonds, liver, etc.	It protects all blood cells from damage	muscle weakness, slow growth
Vitamin K	green leafy vegetables, okra, soybeans, etc.	It helps our body to stop bleeding	liver disease, poor blood clotting

(2) Proteins

Proteins are used to form, repair and grow our bodies. We get proteins from plant and animal foods. Proteins come from the plant sources is called plant proteins. Peas, pulse, nuts and bean seeds are the sources of plant proteins. Similarly, proteins come from the animal sources are called animal proteins. Meats, fish, eggs and dairy products are sources of animal proteins.

food rich in plant protein



food rich in animal protein

(3) Importance of Nutrients

Nutrients are very important for our body. Lack of vitamins may cause different types of diseases such as night blindness, mouth ulcer, rickets, scurvy, and beriberi. Lack of protein also can cause growth failure and loss of muscle. We may get goitre caused by iodine deficiency. The best way to get enough nutrients is to eat a balanced diet with a variety of foods.

night blindness

rickets

iodine deficiency disease (goitre)

Discussion

◆ **Which foods are rich in proteins?**

1. Make a table like the one shown at your right.
2. Make a list of foods rich in plant and animal proteins in the table.
3. Share your ideas with your classmates.

plant proteins	animal proteins

2023

3. Balanced diet

A balanced diet is necessary for keeping our body healthy. A **balanced diet** is a diet that contains adequate amounts of all the necessary nutrients in order to keep our body healthy. We should take balanced diet everyday.

QUESTION : How can we get low priced balanced diet easily?

Activity : Selection of easily available and low priced balanced diet

What to Do :

1. Make a table like the one shown below.

menus		
breakfast	**lunch**	**dinner**

2. Make a list of balanced diet from easily available low priced foods the pictures below.
3. Share your ideas with your classmates.

Safe food

Foods have to be safe. Besides they should be balanced. Rotten, infected and impure foods are called unsafe foods. It is important to keep food clean, theat and covered to maintain food safety.

Summary

Food Types

All the food belong to different groups. In order to get healthy life, we should eat proper amount of food from each of these food types. We can get all

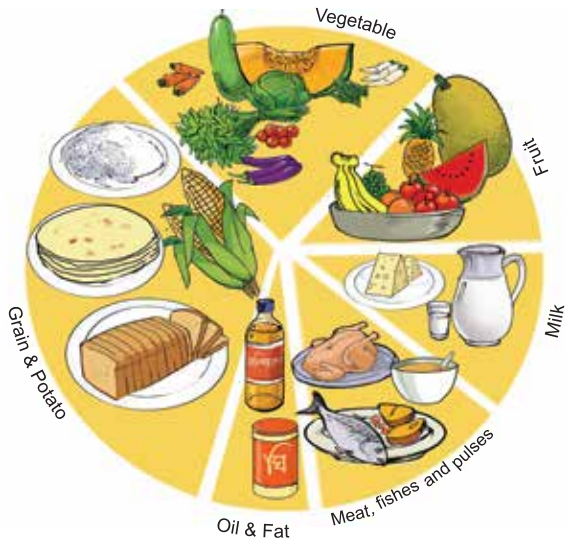
nutrients form variety of foods in each of these food types. Balanced diet contains adequate amounts of all the necessary nutrients. We can select balanced diet easily from available low priced variety of food.

Food groups and its nutrients

food group	main nutrients	foods
Food grain & potato	carbohydrate	rice, wheat, potato, corn etc.
Vegetables	vitamin, mineral	cauliflower, leafy vegetables, carrots, onions, tomato, okra, pumpkin etc.
Fruits	vitamin, mineral	mango, berries, jack fruit, banana, apple, orange, grape etc.
Meat, fishes and pulses	protein	chicken, fish, eggs, nuts, beans, pulses etc.
Milk & dairy products	calcium, vitamin	milk, cheese, yogurt etc.
Oil and Fat	fat	Ghee, butter, mustard oil, soybean oil etc.

A food plate

A picture of the plate helps us to make sure whether we get all the nutrients we need in each meal. The size of the proportions in the plate suggests the amounts of foods we should eat. According to the picture, we should eat vegetables and fruits about half of our plate. We should also drink plenty of water and can choose oil and fat group in a small amount.



a healthy eating plate

Discussion

◆ **Do you eat balanced diet?**

1. Make a table like the one shown at your right.
2. Make a list of foods you had yesterday in the table.
3. Check if your meal is balanced diet or not, comparing the picture of 'a food plate'.
4. Share your ideas with your classmates.

food types	breakfast	lunch	dinner
Grain & potato			
Vegetables			
Fruits			
Meat, fishes and pulses			
Milk & dairy product			
Oil & fat			

EXERCISES

1. Fill in the blanks.

1) We get food from _____ and animals in the environment.
2) The protein from meats, fish and eggs are called _____.
3) We have to eat _____ everyday to keep our body healthy.
4) Lack of vitamin A cause _____.

2. Put a tick mark (✔) on the correct answer.

1) Which food comes from animal?

a. bread b. cheese
c. biscuit d. almond

2) Which nutrient helps form, repair and grow our bodies?

a. carbohydrate b. vitamin
c. fat d. protein

3) Which food mainly includes carbohydrate?

a. milk b. grain & potato
c. vegetable d. meat & beans

3. Short Answer Type Questions:

1) What are the sources of vitamin **C**?
2) What is the function of vitamin **A** ?
3) Name 3 diseases caused by lack of vitamins.
4) What is vitamin B complex? Which food can we get it from?
5) What is safe food?

4. Descriptive Questions:

1) Why is a balanced diet important? Explain.
2) Explain the best way to get enough nutrients.

5. Match the words on the left with the words on the right.

grain food	mango
vegetables	yogurt
fruits	soybean oil
milk and other dairy products	cauliflower
oil and fat	rice

Chapter 5

Hygiene

1. Healthy Lifestyle

It is very important for us to have a healthy lifestyle. A healthy lifestyle helps to keep and improve our health and well-being.

QUESTION : How can we keep ourselves healthy?

Activity : How to remain healthy

What to Do :

1. Make a table like the one shown below.

what can we do to remain healthy?

2. Make a list of the ways to stay healthy in the table.
3. Share your ideas with your classmates.

I take a bath every day to keep myself clean.

I play football every afternoon.

Summary

The best way to stay healthy is to follow the rules of good health and maintain a regular healthy lifestyle. The followings are good habits to keep our body healthy.

Eating balanced diet

We must have balance diet to maintain good health. Every kind of food provides different nutrients that are necessary for our body. We should eat a balanced diet along with drinking enough safe water to maintain good health.

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Regular exercises

Regular exercise and playing sports strengthens our heart, muscles and bones. It also makes us feel more confident and sleep better.

exercises(playing)

Adequate sleep

We need adequate sleep for recovery and growth of our body. We should have a regular bedtime for having a good sleeping.

Time to relax

We sould take some rest to get rid of tiredness and to regain energy for working ahead. A hobby like listening favourite songs, reading books, or working in the garden can help reduce our stress.

sleeping

Personal hygiene

We have to take care of our body to keep it neat and clean. We should take bath with clean water and soap regularly. We should wash hands before and after meals and brush our teeth after meals. We have to change clothes regularly, and take care for the skin, hair, nails, eyes and ears.

It is important to balance all these habits rather than putting emphasis a single habit.

personal hygiene

Discussion

- **What are the good rules to keep ourselves healthy?**
  1. Make a list of your rules to keep your health in your notebook.
  2. Share your ideas with your classmates.
  3. Set the common rules in the class to be followed by all.

2. Waterborne diseases

Waterborne diseases are the diseases caused by taking water contaminated with germs.

(1) Transmission of waterborne diseases

QUESTION : How do waterborne diseases spread?

Activity : Causes of water contamination

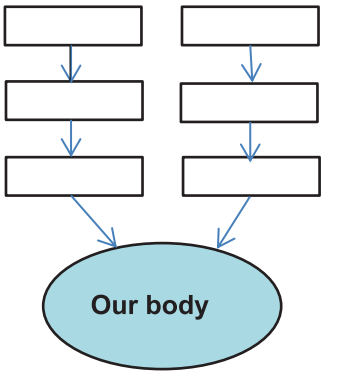
What to Do:

1. Make a table like the one shown below.

causes of contaminating water

2. Make a list of the causes of contaminating of water in the table observing the pictures below.
3. Share your ideas with your classmates.

Discussion



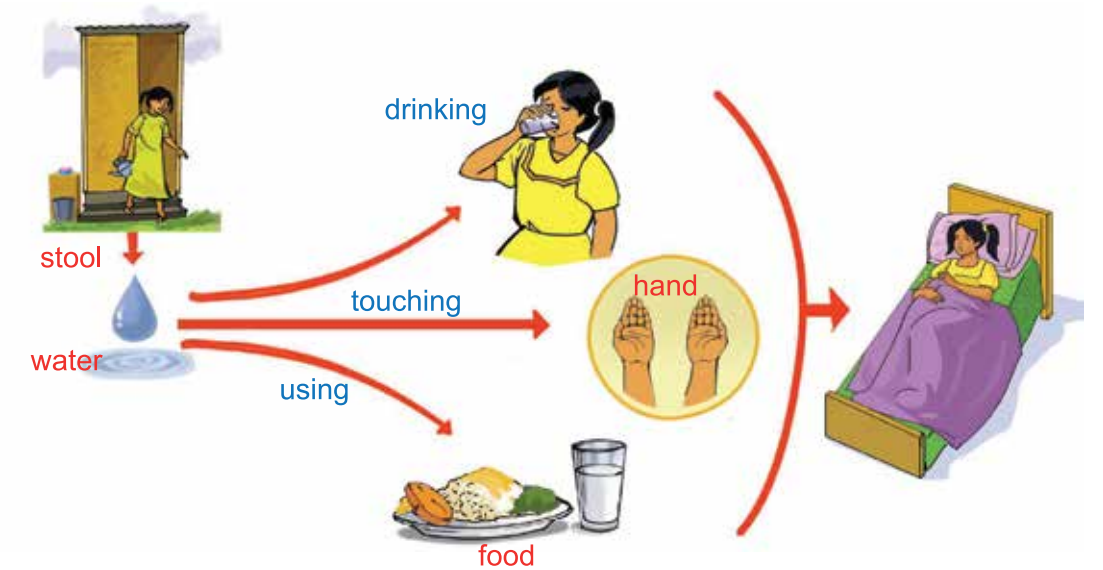
◆ **How can contaminated water get into our body?**

1. Make a chart like the one shown right.
2. Seeing the picture on previous page, make a flow chart of the path of contaminated water from the causes to get into our body.
3. Share your ideas with your classmates.

Summary

Water can be often contaminated by urine and stools of animals or people containing germs such as bacteria. We use water for drinking, preparing foods, bathing, washing clothes, or brushing teeth. We get waterborne diseases if we use contaminated water in these purposes. Waterborne diseases are easily transmitted to people.

contaminated water can cause diseases



transmission of germs from stool to our body

(2) Types and symptoms of waterborne diseases

Contaminated water can cause many types of diseases, including diarrhoea, cholera, dysentery, jaundice and typhoid.
The symptoms of most waterborne diseases are loose motion, vomiting, fever and stomach cramps. If we suffer from diarrhoea, we should take oral saline. Oral **saline** is available in markets. Besides, Oral saline can be prepared at home by using a pinch of salt and a handful of molasses or sugar with half litre of drinking water.

how to make saline

(3) Prevention of waterborne diseases

The best way to prevent waterborne diseases is to stop the transmission of germs. Some measures to prevent waterborne diseases are given below-

Use of safe water

We have to use clean and safe water for drinking, preparing foods, and bathing. We can prepare safe water by filtering, boiling and using water-purifying tablets.

how to wash hands

Washing hands

We should wash hands with soap and safe water before eating, preparing food and after using toilets or playing.

Keeping toilets clean

We have to use hygienic toilet and to keep toilet clean after using it in order to prevent waterborne diseases.

Discussion

◆ **What can we do to prevent waterborne diseases?**

1. Make a table like the one shown right.
2. Make a list of what we can do to prevent waterborne diseases in the table.
3. Share your ideas with your classmates.

what can we do?

2023

EXERCISES

1. Fill in the blanks.

1) Waterborne diseases spread through _____ water.
2) Cholera, dysentery, and typhoid are _____ disease.
3) A _____ lifestyle helps to keep and improve our health and well-being.
4) We can prepare safe water by boiling, filtering and using _____.

2. Put a tick mark (✔) on the correct answer.

1) When must we wash our hands?

a. during eating
b. before eating
c. before using toilets
d. during using toilets

2) What is an effect of moderate exercises?

a. strengthening muscles
b. providing nutrients
c. causing diseases
d. relief from stress

3) What should we take when we suffer from diarrhoea?

a. milk
b. vegetables
c. fish
d. oral saline

3. Short Answer Type Questions:

1) Give two examples of the causes of waterborne diseases.
2) Give three names of waterborne diseases.

4. Descriptive Questions:

1) How can we prevent waterborne diseases?
2) What are the good habits to keep our body healthy?
3) Describe how to keep ourself neat and clean.

5. Match the words on the left with the words on the right.

oral saline	keeping our body neat and clean
keeping toilet clean	relieving diarrhoea
relieve from stress	preventing waterborne disease
personal hygiene	listening songs, reading book

Chapter 6

Matter

There are different objects around us such as book, chair, table, cloths, plants, hills, dust etc. Everything is made up of matter.

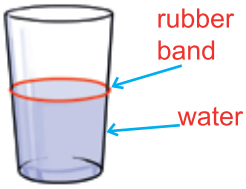
1. Properties of Matter

Matter has different properties. Weight, volume, size and shape are properties of matters.

QUESTION : What are the common properties of matters?

(1) Volume

Activity : Properties of Matter : Part 1

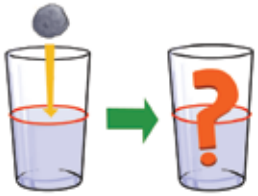


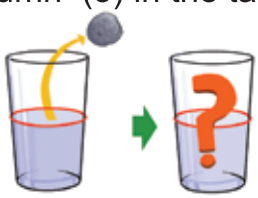
What to Do :

1. Take a clear glass with water, rubber band, some pieces of stones.
2. Make a table like the one shown below.

	(1) Before putting stone	(2) After putting stone	(3) After removing stone
The level of water line			

3. Make the water line of glass with rubber band and draw that picture in the column (1) in the table.
4. Put stones in the glass and observe the water line.
5. Draw the water line in the column (2) in the table
6. Remove stone from the glass, and observe the water line.
7. Draw the water line in the column (3) in the table. .


put stone in the glass


remove stone from the glass

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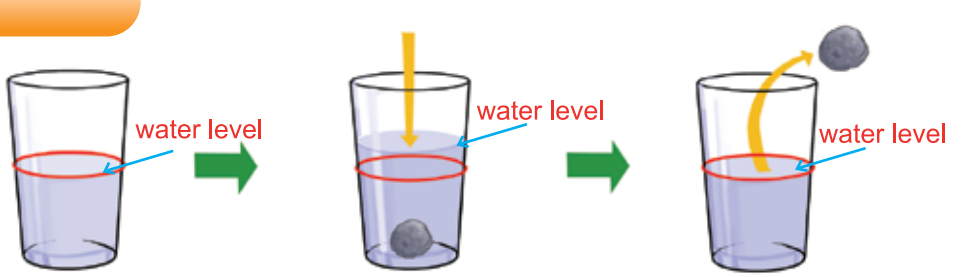
Discussion

◆ **Think about the following points based on your observation.**

1. What happened to the water line of the glass when you put stones in the glass?
2. What happened to the water line of the glass when you remove the stones from the glass?
3. From the results, can you guess what property do matters have?

Result



before putting stone　　after putting stone　　after removing stone

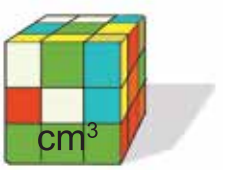
When we put stone into the glass of water, the level of water line in the glass rises. When we remove the stone from the glass, the level of water is lowered to the level of rubber band. From this result, we find that matters take up space of water in the glass.

Summary

Matter takes up space. A textbook takes up space on a desk. When a matter takes up space, nothing else can take up the same space at the same time. The amount of space that matter takes up is called **volume**. Volume is a property of matter.

The volume of a solid is measured in cubic centimetres (cm^3) or cubic metres (m^3). Liquid volume is often measured in mili litres (ml) and litres (L).

Matters take up space on a desk.



a solid matter

a liquid matter

(2) Weight

When we hold something such as a textbook or a pen with a hand, we can feel its weight. What about small things such as a grain of rice or a small piece of paper? Can we feel their weight when we hold them? What do you think? Do you think that they have weight?

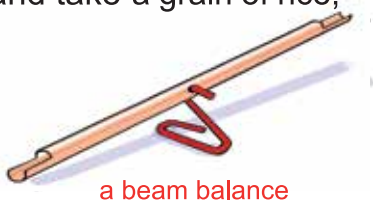
Activity : Properties of Matter : Part 2

What to Do:

1. Prepare a straw beam balance, and take a grain of rice, and a piece of staple.

a grain of rice

a piece of staple



a beam balance

2. Make a table like the one shown below.

	a grain of rice	a piece of staple
(1) your prediction:		
(2) the state of balance		

3. Hold one grain of rice in your hand. Next, hold a piece of staple in your hand. Does it have weight? Write your prediction in the column of (1) in the table.

4. Put one grain of rice to one end of the balance.
5. Observe what happened to the balance, and sketch the state of balance in the column of (2) in the table.
6. Next, put a piece of staple to one end of the balance.
7. Observe what happened to the balance, and sketch the state of balance in the column of (2) in the table.
8. Share your idea with your classmates.

Discussion

◆ **Think about the following points based on your observation.**

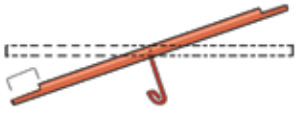
1. What happened when you put objects at one end of the balance?
2. Why do you think it happened?
3. What do you find from the results?

Result

A balance tilted towards the rice.

a grain of rice

A balance tilted towards the staple.



a piece of staple

When we put objects to one end of a balance, the balance will tilt towards the objects even though objects are too small. This result shows that matters have weight.

Summary

Matter has **weight**. All of matters have weight even though they are small particles such as dusts or sands. **Weight** is a measure of how strongly the Earth pulls a matter to the centre of the Earth.

The earth pulls a matter to the centre of it.

We can measure weight of matters by using a measuring device such as a balance or a scale.

The unit of measuring weight is Kilogram (Kg)

General Properties of Matter :

- Matter takes up space
- Matter has weight

a scale

a balance

2. What is Air?

We cannot see air but air is around us. We may feel air when a breeze blowing across our face.

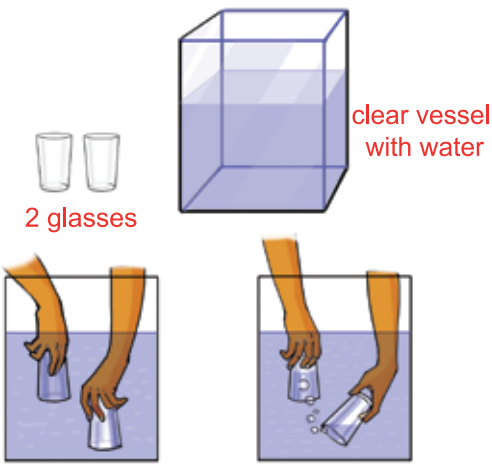
We can find air when branches and leaves of trees are moving.

QUESTION : What are the properties of air?

Activity : Properties of Air : Part 1

What to Do :

1. Prepare 2 clear glasses and a vessel filled with water.
2. Sink one of the glasses into the water and allow it to fill with water.
3. Keep the glass upside down under water.
4. Turn the second glass upside down, and push it under the water.
5. Bring the second glass under the first glass and tilt it up slightly to begin pouring air into the first glass.
6. Observe what happened to two glasses, and keep a record of your observation on your exercise book.



Activity : Properties of Air: Part 2

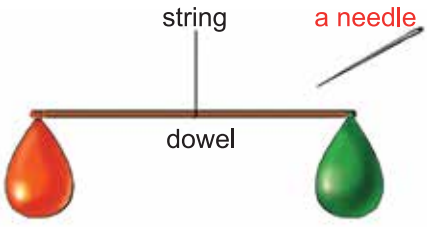
What to Do:

1. Prepare two footballs; one is inflated and another is deflated.
2. Push, hit and slam both of balls.
3. Keep a record on what you feel and observe in your exercise book.

Activity : Properties of Air: Part 3

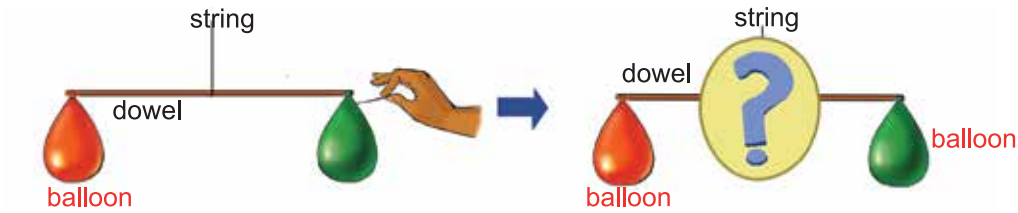
What to Do:

1. Prepare a beam balance, two balloons, and a sharp needle.
2. Blow up the two balloons until they are of equal size and tie them off.
3. Attach each of the balloons to each end of the balance like the picture above.



a balance with two balloons

4. Make the beam balance perfectly horizontal.
5. Prick one of balloon with a needle near the tie on the balloon so that the air slowly escapes from the balloon.
6. Observe what happens to the balance and the balloon.
7. Keep a record of your observation in your exercise book.

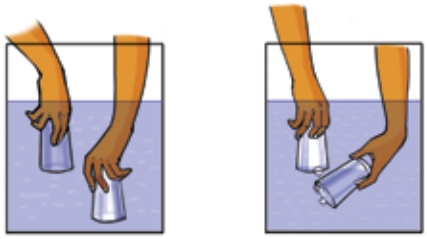


Discussion

- **Based on the activity of Part 1, think about the following points.**
  1. What happened to two glasses? Why?
  2. From this result, do you think what property air has?
- **Based on the activity of Part 2, think about the following points.**
  1. What did you feel and observe when you played with two balls?
  2. From this result, can you find what property air has?
- **Based on the activity of Part 3, think about the following points.**
  1. Does the beam balance stay balanced? Why or why not?
  2. Which side is heavier? Why?
- **From three activities, can you find what properties does air have?**

Result

When we tilt up the second glass filled with air, it allows the air to escape from the glass. The air from the second glass is trapped by the first glass and the air forces the water out of the first glass. This result shows that air takes up space in the glass instead of water.

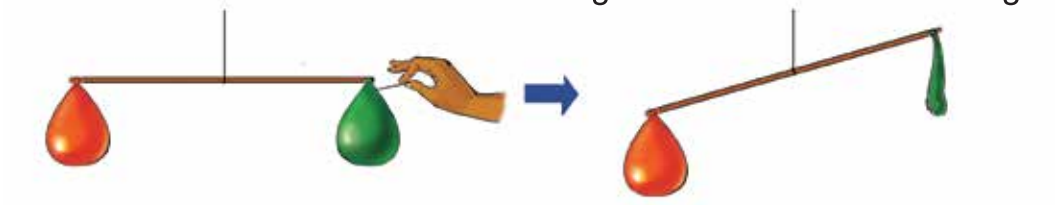


Air takes up space in a glass.

When we hit and press an inflated ball, we feel a resistance from the ball. On the other hand, when we hit and press a deflated ball, we donot feel a resistance because there is no air in the ball. From this result, we find that air can oppose against a pressure.

air in a ball opposes a pressure.

When we prick one of the balloons with a needle, the balance will tilt towards an inflated balloon. Because the balloon still has air inside it and it is heavier than a deflated balloon. We get an idea that air has weight.



A balance tilts towards the balloon filled with air.

Summary

Matter takes up space and has weight. From the results, we also find that air takes up space and has weight. Therefore, air is a matter. Air also opposes against pressure. Air has properties such as:

- Air takes up space.
- Air has weight.
- Air opposes against a pressure

EXERCISES

1. Fill in the blanks.

1) The amount of space that matter takes up is called _____.
2) _____ is a measure of how strongly the Earth pulls a matter to the centre of the Earth.
3) The unit to measuring weight is _____.

2. Put a tick mark (✔) on the correct answer.

1) The common property of matter is:
   a. colour b. odour
   c. volume d. texture

2) Which measuring device can be used for measuring weight?
   a. balance b. ruler
   c. thermometer d. measuring cup

3) What is the unit of measuring cooking oil?
   a. cm^2 (square centimetre) b. L (litter)
   c. cm^3 (cubic centimetre) d. m (meter)

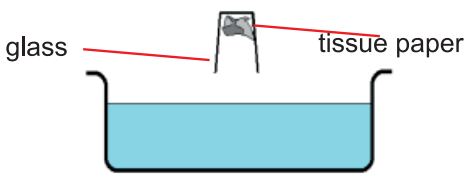
3. Short Answered Questions:

1) What are the three properties of air?
2) What do you mean by the weight of matter?
3) What is meant by the volume of matter?

4. Descriptive Questions:

1) Explain what is a matter?
2) Explain how can we prove through experiments that air is a matter?

5. An upside-down glass with some dry tissue paper attached is slowly pushed into a basin of water.



Answer the following question:

1. What will happen to the tissue paper? Why?
2. What property of air is shown in this experiment?

Chapter 7

Natural Resources

We use various materials according to our needs. Some of those materials directly come from nature. Again we make different materials by using natural things. A **natural resource** is something found on the Earth that is useful to us.

1. Types of Natural Resources

QUESTION : What types of natural resources do we use?

Activity : Where do we get our necessary materials?

What to Do :

1. Make a table like the one shown below.

objects	materials used to make it
books	
jewellery	
House	
car fuel	

2. Make a list of the materials that make the object in the table.
3. Share your idea with your classmates.

Summary

We find that almost everything we use comes from natural resources. We use different types of natural resources for our life in many ways.

(1) Types of Natural Resources

Water Resources

Water is an important natural resource for us. We can get water from ocean, lake, river, pond, and rainfall. Water is used for drinking, washing, cooking, and cultivating or farming. We get fish from river, pond, lake etc. We also use water current to generate electricity.

A river is natural resource.

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Forest Resources

Forest tree is the main source of wood that we use in our daily life. Building materials, paper, and furniture are examples of the uses of trees. We also use trees as fuel to get heat energy.

We get different resources from Forest

Land Resources

We grow crops and farm livestock on land to get foods. We build our houses or buildings on land to live. Soil is also used for building materials and making pottery.

Mineral Resources

We can find some natural resources such as rocks, minerals, oil, coal, and natural gas from land or underground. There are many kinds of **minerals**, including gold, silver, copper, and iron. Limestone and marble are one kind of **rocks.** We use rocks and minerals for making chalks, jewellery, coins, and building materials. By burning oil, coal, and natural gas, we get heat for running machines or vehicles, cooking food, and producing electricity.

minerals

rocks

Other natural resources

Sunlight and wind are also natural resources. We use those natural resources to get energy. Sun provides us with light and heat energy, and electricity can be produced from this light source. We also use **wind** to generate electricity.

A sailboat uses wind to move.

Types and Uses of Natural Resources

natural resources	uses of natural resources
water & water current	drinking, washing, cooking, producing crops and fishes, generating electricity
forest	building materials, wood, paper, furniture
land	growing plants, building a house, building materials, pottery
rocks and minerals	chalk, building materials, wire, coins, jewellery
oil, coal and natural gas	plastics, polythene, fuel, man-made fabrics, urea fertilizer, cooking, heating
air or wind	breathing, making foods for plants, inflating tyres, electricity
sunlight	growing crops, light, making foods for plants, electricity

(2) Natural Resources in Bangladesh

We can find many types of natural resources in Bangladesh. Plants and animals, air, water, soil, and sunlight are available in Bangladesh. We also get natural gas, coal, and some minerals and rocks such as silicon, zircon, limestone, and hard rock in our country.

(3) Classification of Natural Resources

Natural resources can be classified into renewable and non-renewable resources. A **renewable resource** is a natural resource that can be replaced by nature and can be used again. Plants, air, water, and sunlight are examples of renewable resources. On the other hand, a **non-renewable resource** is a natural resource that cannot be replaced or reproduced once it has been used up. Natural gas, Oil, coal, and minerals are non renewable resources

non-renewable resources

Discussion

◆ **What kinds of natural resources do we have?**

1. Classify natural resources into renewable and nonrenewable resources in the table shown right.
2. Share your idea with your classmates.

renewable resources	nonrenewable resources

2. Uses of natural resources to generate energy

Natural resources provide energy that we need for our daily life. **Energy** is the ability to do something. Energy can move something, make sound and produce light and heat.

QUESTION : How do we get energy from natural resources?

Activity : Energy from natural resources

What to Do :

1. Make a table like the one shown below.

natural resource	types of energy
oil	
natural gas	
sunlight	
wind	
water current	
coal	

2. Make a list of types of energy from natural resources in the table.
3. Share your idea with your classmates.

Summary

People use some natural resources to get energy. Anything that can be used to produce energy is called an **energy resource**. Sunlight, wind, water current, oil, coal and natural gas are energy resources.


solar panels transform sunlight into electricity

Sunlight

The sunlight is an important energy resource. People use solar panels to get energy from the Sun. Solar panels are devices that transform sunlight into electricity. We may have seen solar panels on the roofs of houses or on a calculator.


wind turns the blades of wind turbines

Wind

Wind is one of the most promising energy resources. People use wind to produce electricity. When the wind turns the blades of a wind turbine, it spins a generator and produce electricity.


water current from dam generates electricity

Water Current

Water current is one of the energy resources. Water current turns the blades of a turbine and spins a generator to produce electricity.


natural gas is used for cooking on stove

Oil, Coal and Natural Gas

Oil, coal and natural gas are non-renewable resources. They are called **fossil fuels**. When they are burned, they produce heat. The heat is used to cook food, to run vehicles, to produce electricity and to warm houses in the cold countries .

3. Conservation of natural resources

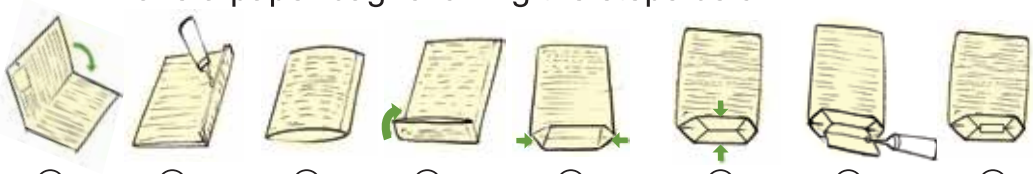
Conservation is the preserving and wise use of natural resources.

QUESTION : How can we conserve natural resources?

Activity : Making Paper Bag

What to Do :

1. Prepare one piece of both sides written papers and gum.
2. Make a paper bag following the steps below.



3. Make a list of uses of paper bag.
4. Share your idea with your classmates.

Summary

Natural resources are limited. So we need to conserve natural resources. There are many ways that we can conserve natural resources.

Reducing the Uses of Resources

The best way to conserve natural resources is being economical while using natural resource. When we reduce trash or energy use, we use fewer natural resources. For example, we can turn out gas burner after cooking.

Reusing Resources

We have learnt how we can reuse paper by making bag with it. When we reuse something, we can reduce trash and help save natural resources. We should use something over and over again before recycling or throwing it away. When something is broken, we should try to fix it instead of putting it in the trash and buying it again new.

reuse cloths by fixing

Recycling Resources

Recycling means using old materials to make new things. If we recycle, we do not have to use more natural resources. For example, by recycling paper, we can reduce the number of trees cut down a year because paper is made from trees.

Newspaper can be recycled

Using Renewable Resources

People get most of electricity mainly from non-renewable resources such as oil, coal, and natural gas. However, non-renewable resources cannot be replaced once they have been used up. Instead, we should use renewable resources such as sunlight, wind, and water current.


renewable resources

Changing Behaviours

The best way to conserve natural resources is to change our behaviours. We can reduce our energy use by turning off lights when they are not needed. We can reuse paper by writing on both sides of paper. We can also recycle the used cans or the old aluminum to make new things.


turning off lights

Discussion

◆ **What will we do for conserving natural resources?**

1. Make a list of what we will do for the conservation of natural resources in the table shown right.
2. Share your idea with your classmates.

what we will do

EXERCISES

1. Fill in the blanks.

1) A ____ is a material found in nature that is useful to people.
2) Gold, silver, etc. are _____ resources.
3) Oil, coal, and natural gas are ____ fuel.
4) Through ___ ,old things can be reproduced into new things.
5) Wind and water current are used to generate ____.

2. Put a tick mark (✔) on the correct answer.

1) Which natural resource is renewable?

a. oil
b. sunlight
c. natural gas
d. coal

2) Which device can change sunlight into electricity?

a. generator
b. windmill
c. solar panel
d. gas stove

3) Which one is the most widely used for energy resource?

a. wind
b. water current
c. sunlight
d. natural gas

3. Short Answered Question:

1) Name four types of natural resources.
2) What natural resources are available in Bangladesh?

4. Descriptive Question:

1) How do we get energy from natural resources?
2) Explain two ways that we can conserve natural resources.
3) Why is it important to increase the uses of renewable energy?

5. Match the words on the left with the words on the right.

gold	non-renewable resource
river	mineral resource
sunlight	water resource
natural gas	renewable resource

Chapter 8

The Universe

Look at the sky. What do you see? We see Sun and the clouds in day sky. We see the Moon and stars in night sky.

1. The Moon

QUESTION : How does the shape of the Moon change?

Activity : Observing the moon

What to Do :

1. Look at the night sky, and observe the Moon with adults.
2. Make a table in your exercise book like the one shown below.

11th Sep	12th Sep	13th Sep	14th Sep

3. Continue to observe the Moon and to draw the shape of it everyday for two weeks.

Summary

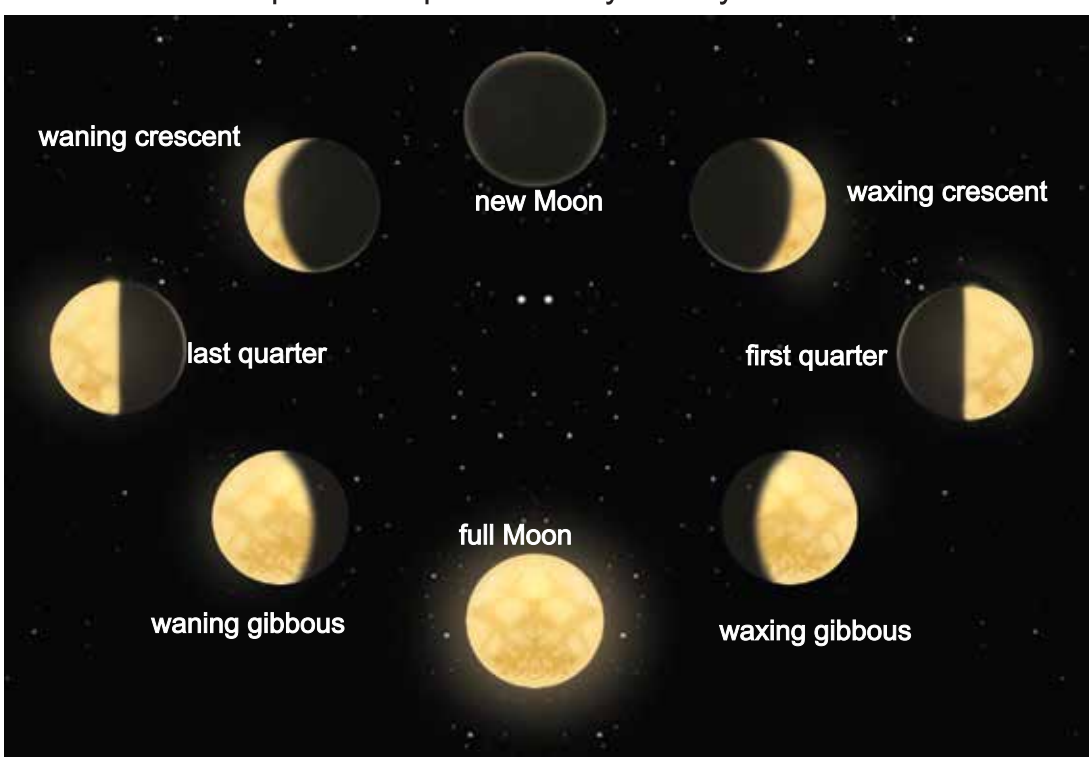
What is the Moon?

The **Moon** is a space object that moves around the Earth. It is a large sphere made of rock materials. It does not have its own light. We can see the Moon when the sunlight reflects on it. From the Earth we can see hills, mountains, and valleys on the Moon with a telescope.

the surface of the Moon

Moon Phases

When we observe the Moon in the night sky, the Moon's shape looks a little different every night. The Moon seems big and round on some nights. On other nights, it looks small and half round-shaped. The changing shapes of the bright part of the Moon that we see are called the **phases of the Moon**. There are eight phases of the Moon. The phases repeat in every 28 days.



eight phases of the Moon

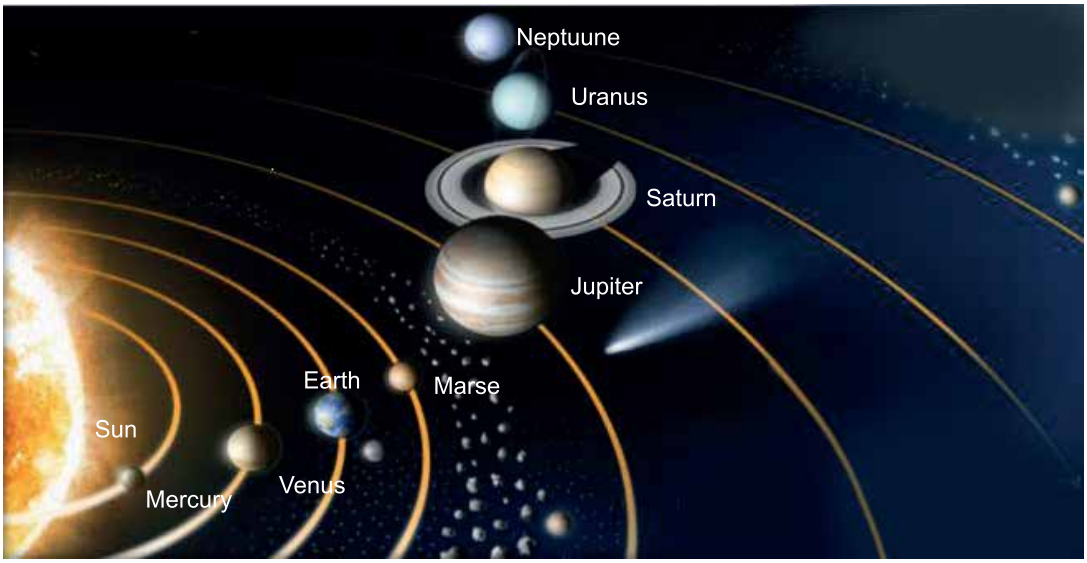
2. The Solar System

What is the Solar System?

The **solar system** is made up of the Sun, all the planets and other objects such as asteroids, comets, dusts, and gas. A **planet** is a large object in space that moves around the Sun. A planet does not produce light of its own. Our Earth is one of the planets of the solar system. The Moon is the only satellite of the Earth.

Planets in the Solar System

There are eight planets in the solar system such as Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune in order from closest to furthest from the sun.



the solar system and its planets

Try it !

Observing Planet : Venus

Have you ever seen any Planet?

We can see Venus in the sky either in the West in the evening known as the Evening Star or in the East before the sunrise known as the Morning Star. Venus is the brightest planet in the solar system that we can observe.

evening star

3. The Galaxy

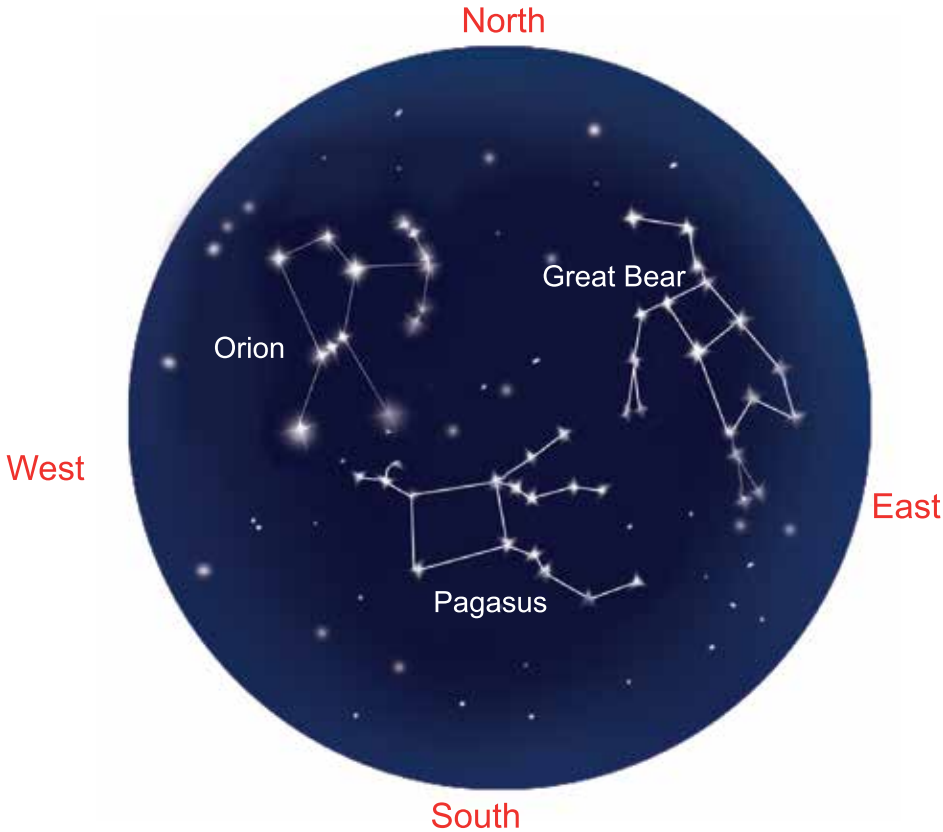
When we look at the night sky, we can see not only the Moon and planets but also many stars.

QUESTION : What is the galaxy?

Activity : Observing stars

What to Do :

1. Look at the night sky, and observe stars with adults.
2. Find the constellations shown in the picture below.
3. Make a record of the name of constellations you found in your exercise book.



Summary

Stars

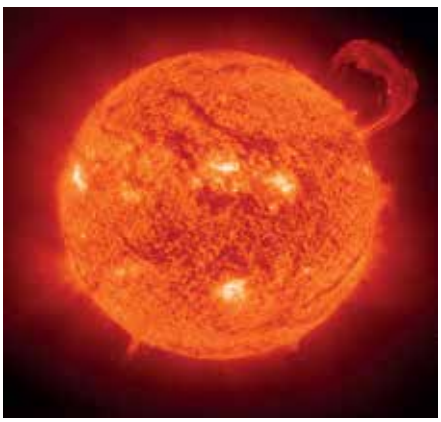
A **star** is a huge ball of burning gases that gives off light, heat, and other energy. The Sun is a star in the solar system. Other stars look much smaller than the Sun because they are far away from the earth.

the constellation

There are numerous stars in the sky. We observe that stars form patterns in the night sky. A pattern of stars with shapes like an animal, person, or object is called a **constellation**. Orion is such kind of a constellation.

Galaxies

The Sun and the planets are part of the solar system. The solar system is part of a large group called a galaxy. A **galaxy** is a huge group of stars and system. The solar system is located in the Milky Way galaxy. The stars and the planets that you see at night are in the Milky Way Galaxy. Milky Way galaxy is spiral-shaped.



The Sun is a star.

The Universe

No one knows for sure how big the universe is. The **universe** is made up of everything that exists, including galaxies, stars, planets, space, all matter, and energy. There are billions of galaxies in the universe. Scientists believe that the universe is expanding with the time.

Milky way galaxy

EXERCISES

1. Fill in the blanks.

1) The _____ is a object in the solar system that moves around the Earth.
2) The sun is a _____ that has light, heat and other energy of its own.
3) Our Earth is one of the planet in the _____.
4) The _____ is made up of everything that exists, including galaxies, stars, planets, space, all matter, and energy.

2. Put a tick mark (✔) on the correct answer.

1) Which one is a star?

a. Earth
b. Mercury
c. Sun
d. Moon

2) Which planet does move around between the Sun and the Earth?

a. Mars
b. Venus
c. Jupiter
d. Saturn

3) How many planets are there in the solar system?

a. seven
b. eight
c. night
d. ten

3. Short Answered Questions:

1) Why do other stars look much smaller than the Sun?
2) What is a galaxy?
3) What is a constellation?

4. Descriptive Questions:

1) Explain the phases of the Moon.
2) What are the differences between planets and stars?
3) What are the components of the solar system?

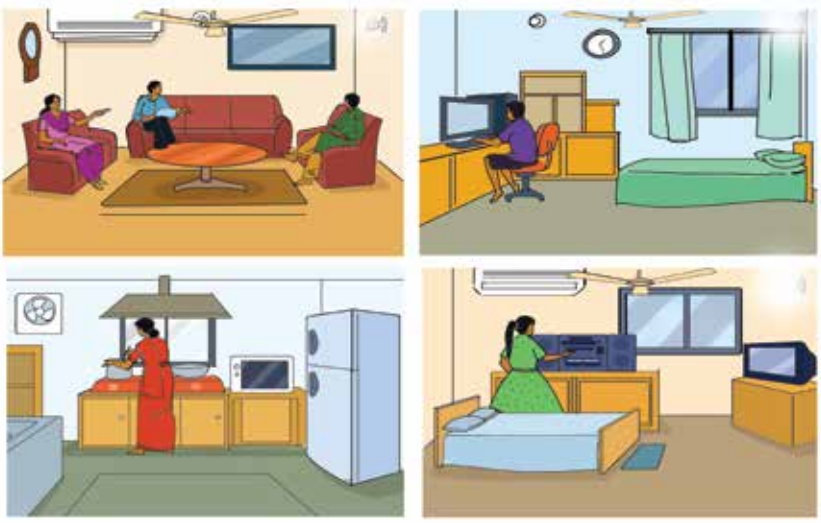
5. Match the words on the left with the words on the right.

the Earth	galaxy
the Sun	satellite
Milky Way	star
the Moon	planet

Chapter 9

Technology in Our Life

By using tools or techniques for controling the environment and finishing necessary task is known as technology. Technology makes our life better, easier and comfortable. The picture below shows the technology used at a house. Can you find these technology?



technology in a house

1. Technology in Daily Life

QUESTION : What technology do we use in daily life?

Activity : The uses of technology

What to Do:

1. Make a table like the one shown below.

using sectors	technology
home	
sports	
entertainment	
medical treatment	

2. Make a list of the technologies that are used at home, in sports, entertainment, and medical treatment in the table.
3. Share your idea with your classmates.

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Summary

We use technologies in different situations of our daily life.

Technology at Home

We can find many technologies at home. There are electric light, fan, iron television, radio, mobile, computer etc. There are the technologies in a kitchen such as gas burner, refrigerator, rice cooker and microwaves.

computer

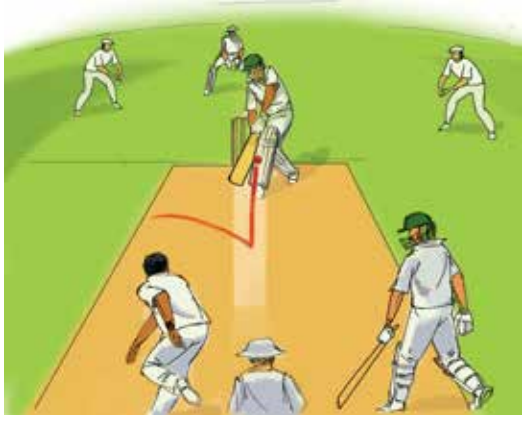
telephone

television

Technology in Sports

Many technologies have been introduced in sports. Examples of sports technologies include the sporting equipment such as football, tennis rackets, cricket bat or ball, clothing, and footwear. At present, video camera is also introduced to a number of sports.

sporting equipments



using video camera in sports

Technology in Entertainment

We use technologies in entertainment fields in our daily life. Computers are one of technologies that are introduced in entertainment. We can play video game, watch movies, and listen to songs with a computer. We also use technologies in music. Musical instruments such as tabala, harmonium, guitar, violin, piano, drums, CD and DVD player are the examples of using technology in music. There are different rides such as Ferris wheel, roller coaster are in the fun-parks. In addition, children's toy and instruments for drawing pictures are examples of entertainment technologies.

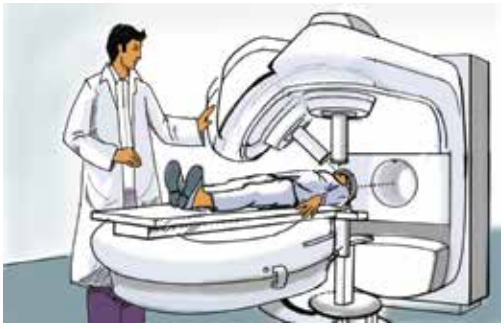
musical instruments

fun-park rides

Technology in Medical Treatment

Advancements in medical technology have allowed doctors to better diagnose and treat their patients. Many types of medical devices have been developed. Thermometer, stethoscope, and blood-pressure meter are examples of simple medical devices. The advanced devices such as X-ray machine, electrocardiogram, ultrasonography, and computerized tomography are also used to examine internal organs. The development of medical technology has made significant contributions to improve the health of people all around the world.

stethoscope



computerized tomography

ultrasonography

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2. Technology in Agriculture

QUESTION : How do we use technology in agriculture?

Activity : Uses of technology in agriculture

What to Do :

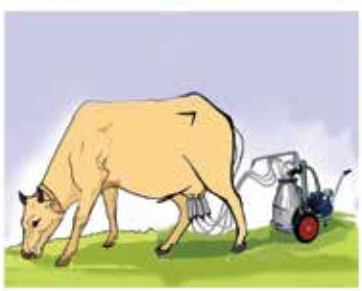
1. Make a table like the one shown below.

agricultural Sector	technology
dairy farm	
paddy field	
fruit farm	
vegetable field	

2. Make a list of the technologies that are used for agriculture in the table.
3. Share your idea with your classmates.







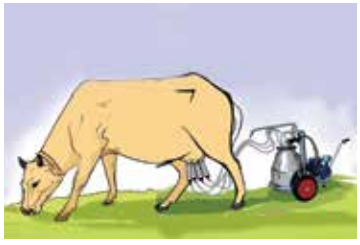

Summary

Technology has played an important role in agriculture. The summary on the use of technology in agriculture is given below.

Agricultural Equipment

Different types of agricultural equipment have been developed. Tractor, cultivator, planter, sprinkler, irrigation pump, harvester, and milking machines are examples of agricultural equipment. It allows a small number of people to grow and to process a lot of food in a shortest period.

tractor



milking machine

irrigation pump

Production of Crops

The modern agricultural technology is applied for the production of crops that resist diseases and pests, and grow very fast. Rice, wheat, and potato are the examples of crops that are improved by technology. Those new types of crops help farmers increase the amount of production of crops and reduce their workload.

Other Technologies in Agriculture

Technology is introduced to collect forestry and to invent new variety of plants. We can use chain saw to cut down the trees and collect wood easily. Technology is used to invent plants with special trait. For example, plant breeding helps us produce the beauty of many different colours of flowers in a species. Those colourful flowers are used for decorating a room or beautifying our environment.

cutting trees with a chain saw

beautifying environment with flowers

EXERCISES

1. Fill in the blanks.

1) _____ makes our life better and comfortable.
2) Cricket bat is a technology used in the field of _____.
3) Advancements in _____ technology have allowed doctors' to diagnose disease easily.

2. Put a tick mark (✔) on the correct answer.

1) Which one is a agricultural equipment?

a. irrigation pump b. violin
c. cricket bat d. roller coaster

2) Which one is the simplest medical device?

a. X-ray machine b. electrocardiogram
c. ultrasonography d. thermometer

3. Short Answered Questions:

1) Write 5 names of technology that are used in sports.
2) What kind of technology are used for entertainment?
3) What are the advantages of medical technologies?

4. Descriptive Questions:

1) How can development of agricultural technology help us?
2) Explain how technology at home makes our life more comfortable.

5. Match the words on the left with the words on the right.

agricultural technology	football
medical technology	tractor
sports technology	video game
technology at kitchen	stethoscope
entertainment technology	gas stove

6. Using the words in the box, write down three sentences about agricultural technology.

disease resistant	advanced technology	high yielding	crops

Chapter 10

Weather and Climate

A weather forecast says "Rainfall activity may increase" or "Light Fog Likely" or "Change in temperature unlikely". **Weather** is what the sky and air like each day. The sky might be sunny or cloudy. The air might be hot or cold.

1. Daily Weather

We know different types of weather. For example, we experience sunny day and rainy day as shown below.

sunny day

rainy day

QUESTION : What do we mean by weather?

Activity : Weather Components

What to Do :

1. Make a table like the one shown below.

Component of weather
rainfall

2. Make a list of components of weather in the table.
3. Share your idea with the classmates.

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Summary

Weather Components

Weather can be described by sky conditions, temperature, humidity, and wind. Those are called **components of weather**.

Sky Conditions

We can find different types of weather in weather forecasting section in the newspaper or the Internet. Bangladesh Met Office uses weather icons to present different type of weather as shown below.

sunny	partly cloudy	rainy	thunderstorm
			

In Bangladesh, thunderstorm in Summer and rainfall in Rainy season is common. Also, fog is common in winter and haze is common in dry season.

fog

Temperature

We feel hot or cold in our daily life. Temperature is how warm or cold the air is. We can describe the weather like a hot sunny day or cold sunny day.

Humidity

We describe the weather as humid when the air around us feels wet and sticky. Humidity is a measure of how much moisture is in the air. When we feel sweating, humidity is high. When we feel dry, humidity is low. We use 'wet' and 'dry' to describe the weather.

Wind

Wind is moving air. Wind can be strong or weak (light). Wind can be measured by its direction and speed. Wind direction is the direction from which wind originates. For example, a northerly wind blows from the north to the south. Wind strength can be easily described by observing hoisting school flag, trees and so on.

2. Weather Observation

We have already known about the weather components. Are those components changing every day? Let's observe!

QUESTION : Does weather change every day?

Activity : Collecting Weather Data

What to Do :

1. Make a table like the one shown below.

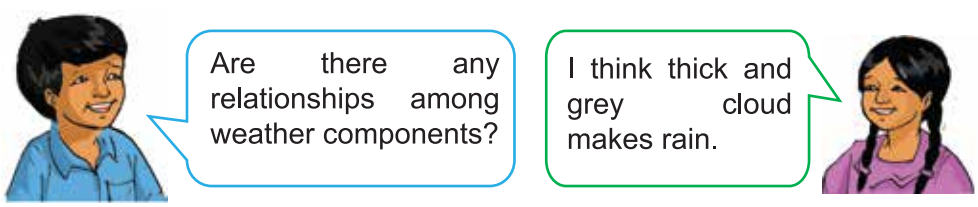
components of weather	example	1st day	2nd day	3rd day	4th day	5th day
Condition of the sky	over-cast					
cloud	white & fluffy					
temperature	32 ℃					
wind direction	north					
wind strength	mild					

2. Observe the Condition of the sky, cloud, wind direction and strength, and write the information in your note book.
3. Measure air temperature and write down in your notebook.
4. Share the idea with your friends.

Discussion

◆ **Discuss the following questions in the class.**

1. Which weather component is changed most?
2. Which weather component is the most important for our daily life?
3. Can you relate any weather component with any weather condition?



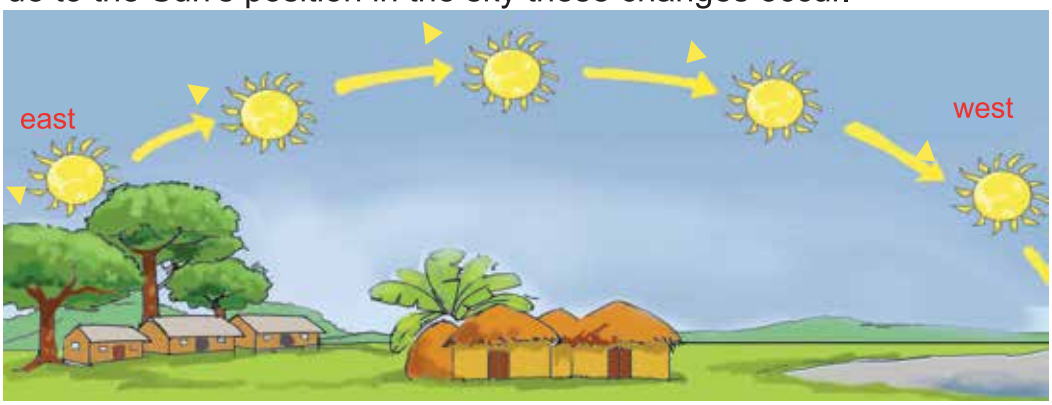
Summary

Weather is the temporal state of sky and air so weather is changing every day. We do not experience completely same weather. Weather is changing due to various reasons.

Causes of weather Changes

(1) Temperature Change

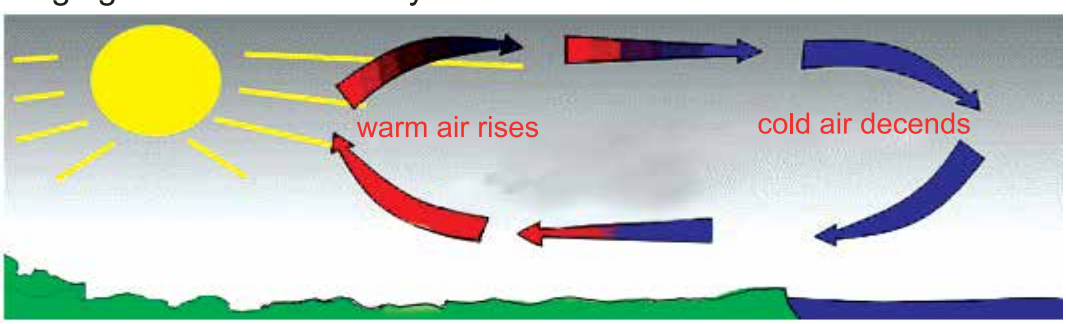
When the sun rises in the morning, air becomes warmer and temperature goes up. When the sun sets, the air becomes cooler and temperature goes down. These temperature changes are called as diurnal change. Due to the Sun's position in the sky these changes occur.



The Sun's position in the sky is different from morning to evening.

(2) Wind

Wind causes weather changes. For example, cloud of a certain area is blown to other area by wind. Wind also moves clouds from the sky and make it clear. Winds are formed when the Sun heats up some parts of the Earth more strongly than others, and the difference in temparature makes the air move. Sometimes the weather can be very powerful, bringing violent storms or cyclones .



formation of air flow

3. Cloud and Rain

QUESTION : How are cloud formed?

Activity : Making cloud in a plastic bottle

What to Do :

1. Prepare a clear plastic bottle.
2. Add a small amount of warm water to the plastic bottle.
3. Put the cap and shake it up so that water droplets are sticking to the inside of the bottle. Pour out the excess water. Water is the first ingredient for cloud formation.
4. Carefully light a match and shake it up so the match burns out with help of your teacher. Then drop it into the bottle. Immediately replace the cap and shake it back and forth 2-3 times. The smoke adds dusts as the second ingredients for cloud formation.
5. Using both hands, squeeze the center of the plastic bottle as hard as we can, and then release both hands evenly and very quickly. We are now simulating the third ingredient temperature and pressure changes.
6. After several squeezes we could see a cloud that appears when you release your hands.

Be careful when a match is lighted.

squeezing

releasing

Summary

Cloud

Sea or river water evaporates due to the heat of the sun and it becomes water vapour. When water vapour in the air is cooled, water vapour condenses on a tiny dust to form a small water droplet. These small water droplets float in the sky as a cloud. We can see many kinds of clouds. Clouds are classified by their shape and their height above ground. Fog is a kind of clouds that you can feel or touch at the ground. When fog accumulated on something like leaves or grass and form tiny water droplet then it is called dew. Whereas haze is made from dry particles such as dust.

fluffy and white cloud (cumulus)

white and layered cloud (altostratus)

towering and heap cloud (cumulonimbus)

gray and layered cloud (nimbostratus)

Rain

Small cloud droplets aggregate into a big water drop. Big water drops cannot float in the sky and then fall on the earth as **rain**. Sometimes we see hails drop during rain. Hail is a type of frozen rain in the form of balls or irregular lumps of ice.

4. Weather and Climate in our Life

QUESTION : How does weather affect our life?

Activity : Identifying effects of weather

What to Do:

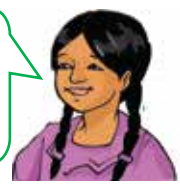
1. Make a table like the one shown below.

effects of good weather	effects of bad weather

2. List up effects of good and bad weather.
3. Share your idea with your classmates.

Rain provides water needed for all plants and animals.

Heavy rainfalls cause floods!



Summary

Weather and our life

Weather affects our life in various ways. We put on warm clothes when it is cold. We go out with an umbrella in a rainy day or in a sunny day. Rainfalls provide us water resource. Plants become fresher and crops grow well with the help of rain water. However, all types of weather do not always bring good results.

Flood

What happens when it rains heavily for a long time? Where does the water go? Water from river spills on to the land and then roads go under water. Crops go under water. Houses may also go under water. This situation is flood.

5. Climate

QUESTION : What is climate?

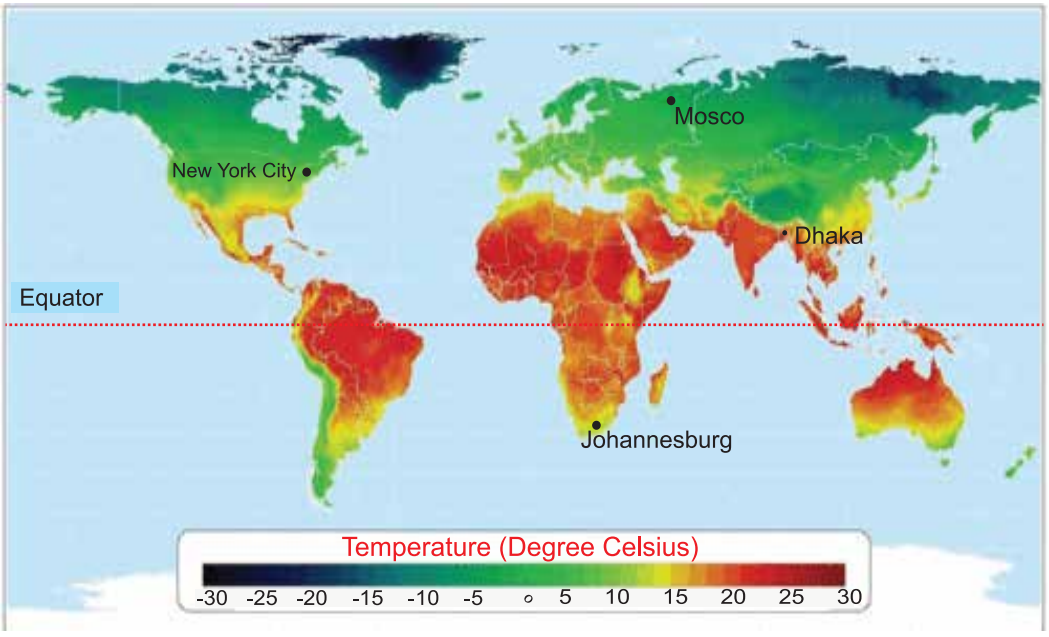
Activity : Distribution of Temperature on the Earth

What to Do :

1. Make a table like the one shown below.

country	mean temperature (degree celsius)
Dhaka, Bangladesh	26

2. The picture below shows the distribution of temperature on the Earth.
3. Looking at the picture below, make a list of your findings about temperature distribution in the table.
4. Share your idea with your classmates.



Summary

Climate

Weather may change every day but there is a usual weather pattern. We call this usual weather pattern as our climate. Climate is the average weather condition on an area for many years.

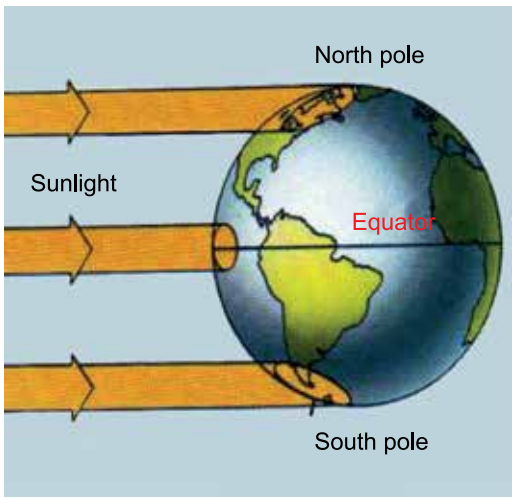
The annual average temperature of Dhaka in Bangladesh is 26°(degree) Celsius. In general, the climate of Bangladesh is classified as hot and humid climate. Russia is situated to the farthest north of Bangladesh. This country is extremely cold in the most of the time of the year. The annual average temperature of Moscow in Russia is 6°(degree)Celsius. The climate of Russia is classified as cold climate.

Yearly and Monthly Average Temperature at Dhaka and Moscow (Degree Celsius)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Dhaka	19	22	27	29	29	29	29	29	29	27	24	20	26
Moscow	–7	–7	–1	7	13	17	19	17	11	6	–1	–5	6

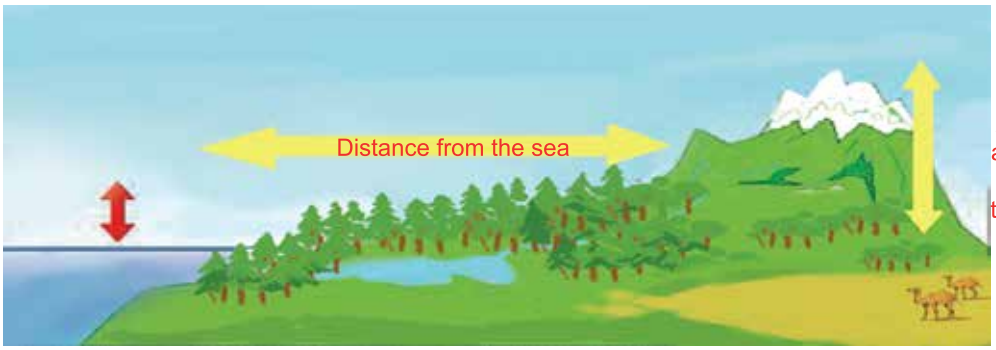
Climate in particular area depends mainly on area's latitude, its altitude, and distance from the sea.

The latitude is the distance from the equator. Near the equator, the Sun's rays shine straight down. The Sun warms the surface of the Earth most strongly at or near the equator. As a result place near the equator become the warmest places. As the surface of the Earth is curved, places further away from the equator are warmed much less strongly by the Sun, and so they are colder.



latitude and climate

The higher the latitude, the colder the climate is .



factors affecting climate

Climate of Bangladesh

In Bangladesh, there are six seasons such as Summer, the Rainy season, early Autumn, late Autumn, Winter and Spring. In Bangladesh Summer consists of *Baishakh* and *Joystha* and it is the warmest season of the year. The Rainy season consists of *Ashar* and *Shraban* and it comes with heavy rainfall. Eearly Autumn consist of *Vadra* and *Ashwin*. White and fluffy clouds are seen in the sky in this season. *Kartik* and *Agrahaon* are the late Autumn. This is the season of harvest. *Pous* and *Magh* are Winter when we usually feel cold in Bangladesh. Then gradually the cold is relieved and the weather is getting warmer in Spring months, *Falgun* and *Chaitra.* This is the usual pattern of Bangladesh's climate. Year after year we are experiencing the same climate.

six seasons of Bangladesh

Seasonal pattern in Bangladesh is different from other countries in the northern hemisphere. In other countries, there is only four seasons. Summer, autumn, winter and spring mean June to August, September to November, December to February and March to May, respectively.

EXERCISES

1. Fill in the blanks.

1) _____ is the usual weather pattern for a long period of time at a particular area.
2) The small droplets of cloud aggregate into _____.
3) Bangladesh is covered with fog in _____.
4) _____ is necessary to grow good crops.

2. Put a tick mark (✔) on the correct answer.

1) Which one is not the component of weather?
   a. temperature b. humidity
   c. latitude d. wind
2) What is the main cause of the change of weather?
   a. Rain b. Fog
   c. Wind d. Cloud
3) From which cloud is formed?
   a. air b. sunshine
   c. dew d. water vapour
4) Which one determines the climate?
   a. equator b. distance from the Sun
   c. Moon d. distance from the sea

3. Short Answered Questions:

1) Write the names of the components of weather.
2) What is humidity?
3) What is the difference between fog and dew?

4. Descriptive Questions:

1) Describe the climate of Bangladesh.
2) Explain how clouds are formed.
3) What are the problems of heavy rainfall?
4) What are the differences between weather and climate?

5. Match the words on the left with related words on the right.

temperature	strong or calm
humidity	hot or cold
wind	heavy or light
rainfall	wet or dry

Chapter 11

Life Safety and First Aid

Accident happens suddenly. It causes injury and damages our wealth. We often hear about or see accidents. We might have accident ourselves now and then.

QUESTION : How can we prevent accident around us?

Activity : Accidents in our life

What to Do :

1. Make a table like the one shown below.

dangerous situation or accident

2. Find the potential dangers in the picture below, and make a list in the table.
3. Share your idea with your classmates.

Summary

Accidents can happen anywhere in and around at home, school, road or in the playground.

(1) Types of Accident

Common types of accident that we fall are cuts, choking, fires, burns, electric shock, and poisoning. We may have other accidents such as traffic accident, bites with snakes, and drowning in water.

(2) How to Prevent Accident

Most of the accidents are preventable. Examples of how to prevent accidents of drowning, snakebite, and fire are given below.

Drowning in Water

We all enjoy swimming and bathing in a pond, a canal, or a river. We also hear of drowning in many places in our country every year. We can prevent ourselves from drowning by learning how to swim. We should not swim alone without help of the older and should not dive under water. We also should keep an eye on others while we play in water.

drowning in water

Snake Bites

People in the villages are often bitten by snakes in our country. Snakes live not only in bushes and forests but also around our houses.
We can avoid snakebites by taking the following steps:

- Never try to handle a snake.
- Avoid places where snakes may live like tall grass or bush, rocky areas, and holes in the ground.
- Use a long stick if we must go into tall grass or bush.
- Shine a flashlight on your path when walking outside at night.
- Keep your yard tidy to reduce places where snakes hide.

snake bite

Fire Accident

We may have fire accidents in our daily life. We may get injuries such as burns when we cook for food or touch hot objects such as a stove. Fires may occur due to lack of attention when cooking, careless use of candles or lamp, short circuits of electrical appliances. Fires may occur due to throw burning beedi, cigarettes, safty match in unsafe areas or if the children play with match or lighter.

fire accident

The followings are different ways to prevent fire accidents.

- Don't play near the stove and never play with fire.
- Don't wear clothing with long, loose sleeves when cooking,
- Keep flammable objects such as clothes, paper, dry wood etc. away from heat and flames.
- Don't overload wall outlets.

If we have fire accidents, we should extinguish fire in its initial stages. We can put off a fire by using a fire extinguisher, covering a fire with a wet blanket, or pouring water at the base of the fire. If fire becomes big and severe, we should evacuate the building. Contact the fire station near by as soon as possible. Do not fight alone with fire. Personal safety comes first .

putting off a fire with extinguisher

evacuating the building

2. First Aid

QUESTION : How can we save people who get involved in an accident?

Activity : What if you are there?

What to Do:

1. Make a table like the one shown below.

Accident	What would you do?
drowned in water	
bitten by a snake	
burned with fire	
an electric shock	

2. Make a list of what you would do if you saw the accident in the table.

Summary

If our friends get injured by accidents, we will help them until others get there. **First aid** is emergency care or treatment given to an ill or injured person before medical services arrive. First aid is important because it can sometimes save a person's life. There are some rules of first aid. How to provide first aid in different accidents are as follows:

call for help!

1. **Calling for help**
   First of all, we should call adults or emergency service for help.
2. **Keeping ourselves safe**
   Before we do anything to help an injured person, we make sure to keep ourselves safe otherwise we may also get involved in an accident.
3. **Do not move injured person**
   Do not move an injured person unless it is necessary.

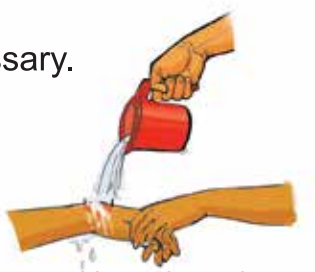
keep a person calm!

4. **Keep the person calm**
   Calm the person down by saying something encouraging like "You're going to be okay"; " Everything will be alright."

(1) Burns

- Use cold running water to cool the burn for at least 10 minutes.
- Do not apply ice to cool the burn.
- Do not break blisters.
- Apply Barnaul or water mixed with coconut oil on slightly burned place.
- See a doctor as soon as possible if necessary.

burn



cool the burn with cold running water

(2) Drowning

When we find a drowning person:

- Call adults for help, and send someone to call emergency service.

rescue of a drowning person

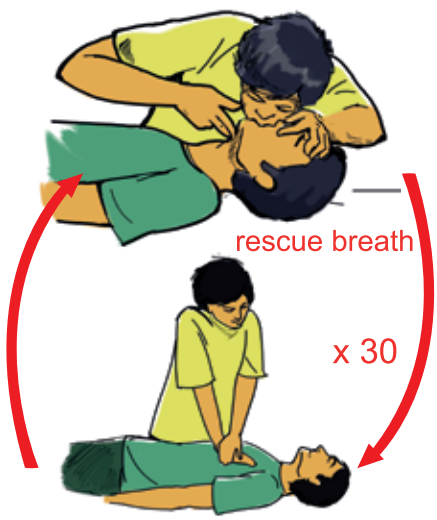
How to Rescue

- If it is safe and possible, take the person out of the water by using a long pole or rope to try to reach the person, or flotation devices like a banana tree or a wooden plate so that he/she can catch them and come to the shore.
- Do not attempt a swimming rescue yourself, or we may also get drowned.

When not breathing

- Open their airway by gently tilting back the head and lifting the chin like the picture shown right.
- Pinch the nose and place your mouth over their mouth and blow until their chest rises. But the patient should be allowed time to breath out.
- Watch for the chest to rise as you give these breaths. If the chest does not rise, reposition the head and try again.
- Place your hand over the center of the chest and lean over like the picture shown right. Give 30 chest compressions by pressing down about a third of the depth of the chest.
- Continue rescue breaths and chest compressions until they are breathing or doctor arrarival.

open airway by lifting the chin



chest compression

(3) Electric Shock

What is Electric Shock?

Electricity can pass through the human body. An electric shock occurs when a person contacts with the source of electricity. If any part of the body receives an electric shock, it causes injury such as burns and damage to the heart that could cause the heart to stop. Such kind of accident is called electric shock.

Rescue and Treatment

1. Separate the person from the source of electricity as quickly as possible.
   - Turn off the power by unplugging the cord, by turning the main switch off, or by turning off the breakers.
   - If it is impossible to turn off the power, use a board, dry wooden stick, or rope to get the person away from the source of electricity. If possible, stand on a rubber mat, gunny bags or folded newspapers.
   - Do not touch the person who are receiving the electric shock, or you will suffer one too.
2. Call emergency services for help as soon as possible.
3. Give first aid for electric shock if necessary.
   - Check for the person's consciousness, breathing, pulse, and injury.
   - If the person has a burn, give first aid for burns.
   - If the person is not breathing, give first aid for rescue breaths and chest compressions.

turn off the main switch

rescue a person with a dry wooden stick

checking breathing and pulse

(4) Snake bites

What we should do:

- Move away from the snake.
- Try to remember the color and shape of the snake.
- Call emergency services for help as soon as possible.

While waiting for medical help:

- Keep the person as still as possible.
- Lay down with the bitten body part below the level of the heart.
- Remove any items or clothing around the wound.

What we should NOT do:

- Don't try to suck the venom out.
- Don't cut the skin around the wound.
- Don't apply ice.
- Don’t move the person unless in immediate danger.
- Don’t try to catch the snake.
- Never go to snake charmers for treatment.

moving away from snake

first aid for snake bite

don't cut the skin around the wound

Try It !

◆ **What will you do?**

1. Under the instruction of a teacher, let’s practice the rescue and first aid with friends the following situations.
   - When we find a friend who get involved in an accident
   - When a friend gets burned with fire
   - When a friend is drowning in water
   - When a friend gets an electric shock
   - When a friend is bitten by a snake

EXERCISES

1. Fill in the blanks.

1) _____ is anything that happens by chance and causes damage or injury
2) Snakes live not only in bushes and forests but also around our _____.
3) We can prevent drowning by learning how to _____ .
4) An electric shock occurs when a person contacts with the source of _____.

2. Put a tick mark (✔) on the correct answer.

1) What is the good way to prevent fire accidents?
   a. keep clothes or paper away from heat
   b. play with fire.
   c. Use full sleeve cloths while cooking
   d. keep away from fire

2) What should we do for a burnt person?
   a. cool the burn with cold running water.
   b. use ice to cool the burn.
   c. apply lotions or butter.
   d. break blisters as soon as possible.

3) What should we do for a person bitten by snake?
   a. keep the person as still as possible.
   b. try to suck the venom out.
   c. cut the skin around the wound.
   d. try to catch the snake.

3. Short Answered Questions:

1) What types of accidents are there at home?
2) How should we separate the person from the source of electricity?
3) How do we give fast aid to a burned person?

4. Descriptive Questions:

1) What are the general rules of first aid?
2) Explain how to rescue a drowning person.
3) How can we prevent snakebite?
4) When a person is not breathing, what should we do?

Chapter 12

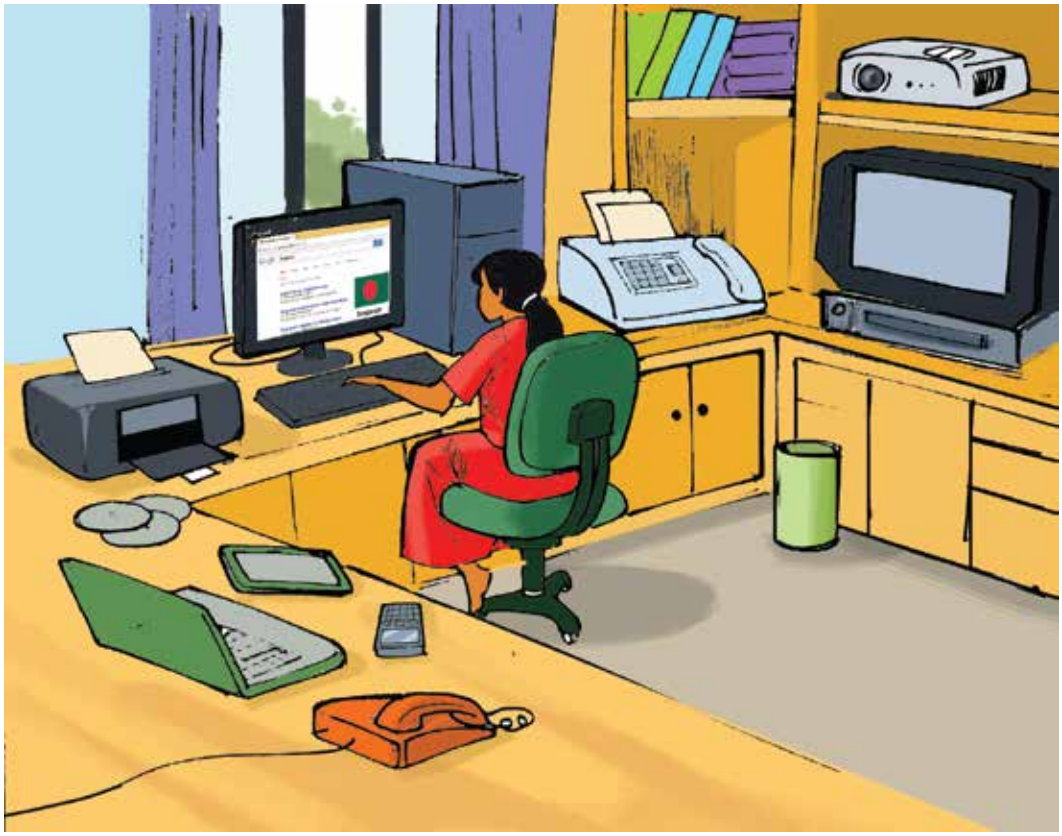
Information in Our Life

Information is very important for our life. By using information, we bring change of our life style. Information helps us to decide what to do.

The technological tool used to create, collect, analyse and exchange information is called Information and Communication Technology. It is called ICT in short.

ICT makes our life easy and is used in many ways in the fields of business, education, medical and agricultural services. There are various types of information and communication technologies such as Computer, the Internet, Mobile phone, TV, Radio, and Camera, are examples of ICT.

The picture below shows many things in a room. Let's find out the Information and Communication Technologies at home.



ICT in a room

2023

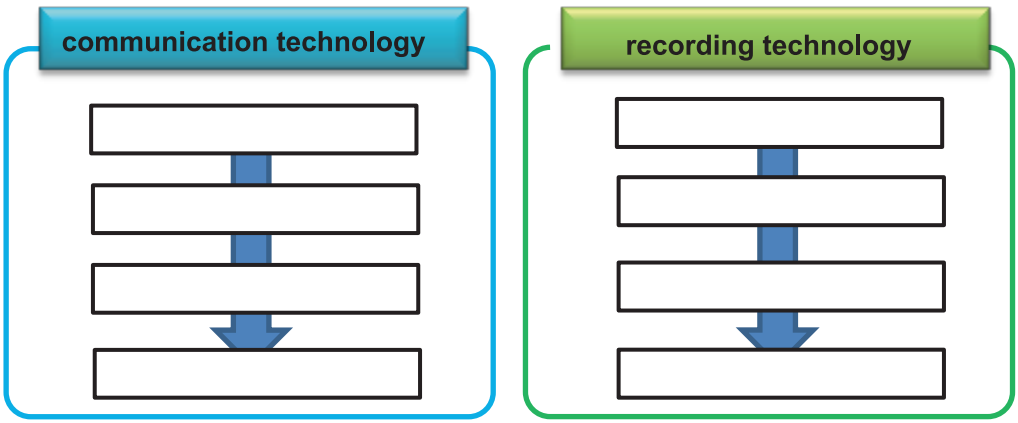
1. Improvement of ICT

QUESTION : How has ICT improved?

Activity: **Development of ICT**

What to Do:

1. Make a diagram like the one shown below.



2. Classify the pictures of ICT below into 2 groups: Technology for communication and Technology for recording, and arrange them from oldest to newest in the above diagram.


telegraph


tape recorder


paper


internet


wall painting


telephone


CD

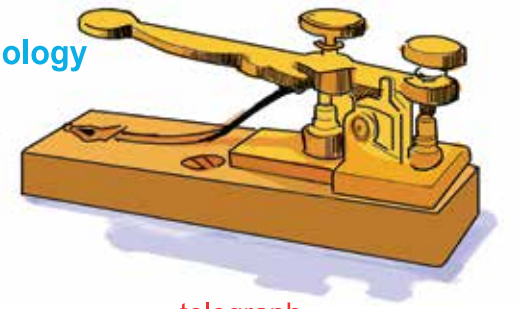

TV

Summary

People have invented and developed various types of technologies in order to pass on information to others. Information and communication technologies (ICT) can be largely classified into two groups: Technology for communication with people (Communication Technology) and Technology for recording information (Recording Technology).

Development of Communication Technology

The history of communication technology began thousands of years ago with the use of smoke signals and drums. In next stage of information technology, people exchange information through sending letter, introducing newspapers, book, journals etc. In the modern age, the telegraph was invented by Baron Schilling in 1832. A scientist named Samuel Morse succeeded to send information through wire using telegraph in 1837. In 1876, Alexander Graham Bell invented the telephone to talk directly with other people across large distances. After that, a radio followed by a television was invented. Now a days, we use ICT such as a computer, mobile phone, and the internet for communication.



telegraph

Alexander Graham Bell speaking with a telephone.

Development of Recording Technology

In ancient time, people drew pictures on the cave wall or used lithograph to record information. After the invention of writing, people used paper to write down the message. After the invention of printing press, people have kept a record of a lot of information on books. Now a days, people use a camera, a tape recorder, a video recorder, pen drive, CD, DVD and memory card to store the information.

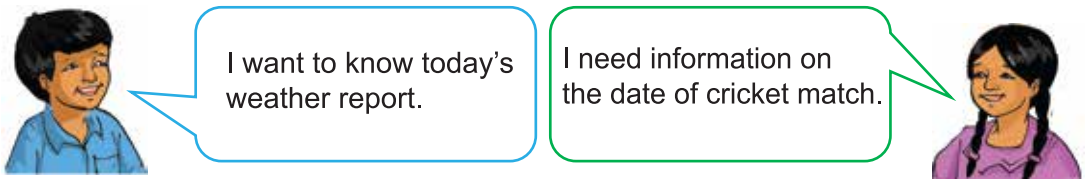
technology for recording information

2. Use of Information

We get a lot of information every day. The amount of information is increasing at a rapid pace. Therefore, we need to make a good use of information in our life. The use of information includes the activities like collecting, storing, and sharing information. The following steps show a wise use of information:

Step 1: Deciding what types of information you need

We may need different types of information at one time or another. News, weather, events, ideas, or people's experiences are examples of information.

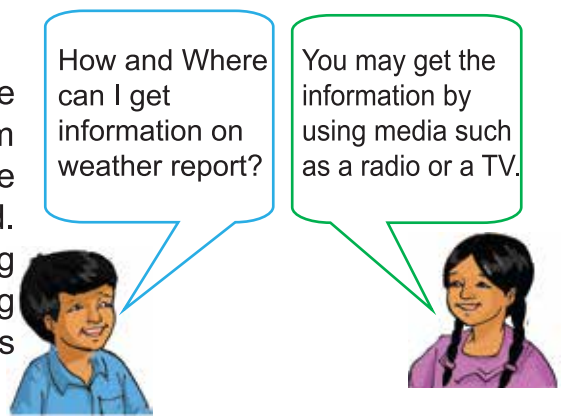


Step 2: Finding the ways and sources for collecting information

You must find the ways and sources that are best suited to the information you need. You may get the information by observing and asking people. There are different source of information such as people, newspaper, books, the internet, TV, and radio.

Step 3: Collecting the information

Necessary information should be collected with the best ways and from reliable sources. During collecting the information, we should keep a record. We can store the information by taking a note on a notebook or paper, or using a recording technology such as camera, CD and DVD.



Step 4: Sharing the information

Before sharing information, organize the information on the exercise book or papers based on your recording. When sharing the information with someone, we should pay attention to what we want to say and how we can give clear explanations to our friends.

QUESTION : Can I collect, store and share information?

Activity : Collecting, Storing, and Sharing Information

What to Do:

1. Make a copy of "Information Collection Sheet" like the one shown below in your exercise book.

Information Collection Sheet

a. Types of Information you will collect

e.g. weather report, your body temperature, cricket news, etc

b. How to collect information (Ways)

c. Where to collect information (Sources)

d. Information you collected

2. Seeing the Step a to c in the previous page, fill in "a. Types of Information", "b. How to collect information" and "c. Where to collect information" in the sheet.
3. Collect information you need and keep a record of the information you collected in the sheet.
4. Organize the information in your exercise book based on your information collection sheet.
5. Prepare the presentation, and share the information with your classmates.

3. Let's play with Block-Code

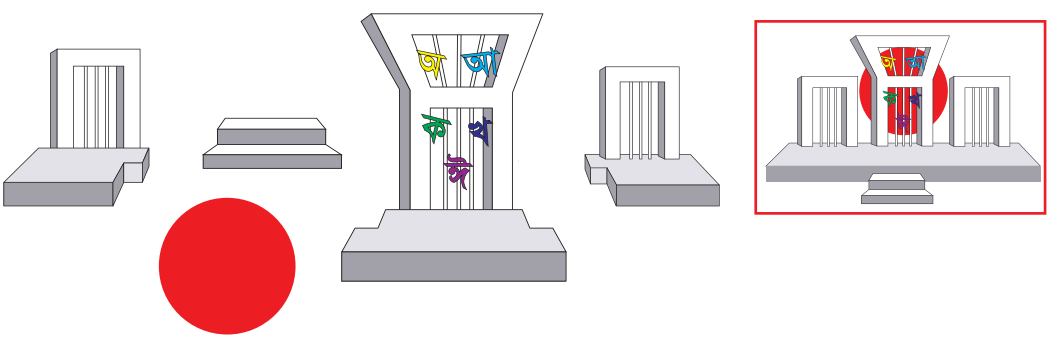
We have learnt about code or command in class three. We have also learnt that computer or machine follows a series of commands or codes while doing an activity. We can do any task or solve any problem in a computer or mobile phone by giving commands. Now, let us see how a problem is to be solved by using computer or mobile phone.

Question: How is a program developed using Block-code?

Activity: Make the whole joining the blocks

What is to be done:

1.Make a Shahid Minar arranging the blocks logically



2.Let's discuss about the task with the classmates.

The Shahid Minar will not be completed unless the blocks are arranged logically

The red circle must be kept in the middle

Discussion

- **Let's think about the following subject**

1. Could we develop the Shahid Minar without arranging the blocks sequentially? Put logic in favour of your opinion.
2. Let's discuss the activity / matter with the classmates.

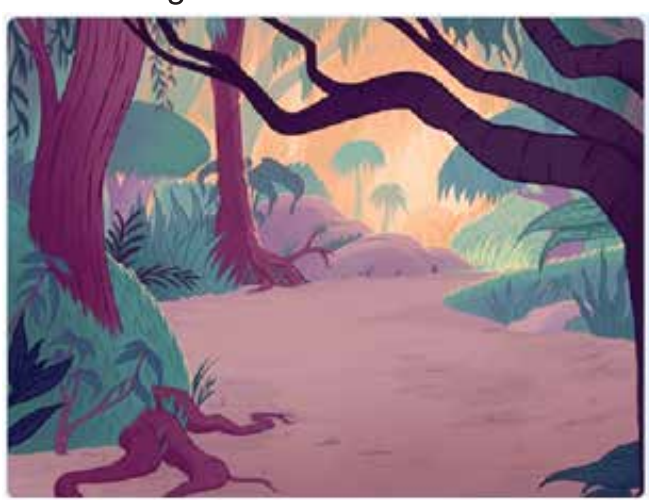
Summary

We have seen that a complete object or content can be made joining small blocks. For example, the complete picture of the Shahid Mainar has been developed by joining the different parts of the picture logically. We can do the activity also by a machine such as computer or mobile phone. We can use computer program to do this activity. is SCRATCH of one such type of the popular programs.

Introduction of Scratch

Scratch is a visible block-code or programme. Different types of games, animation video, image etc. can be created using computer, tablet or mobile phone by dragging, and joining serially. Block-codes are used for controlling Sprite and Backdrops. Sprite is the name of a character of cartoon. Different types of Sprites and Backgrounds are used as per requirement while working with Scratch.

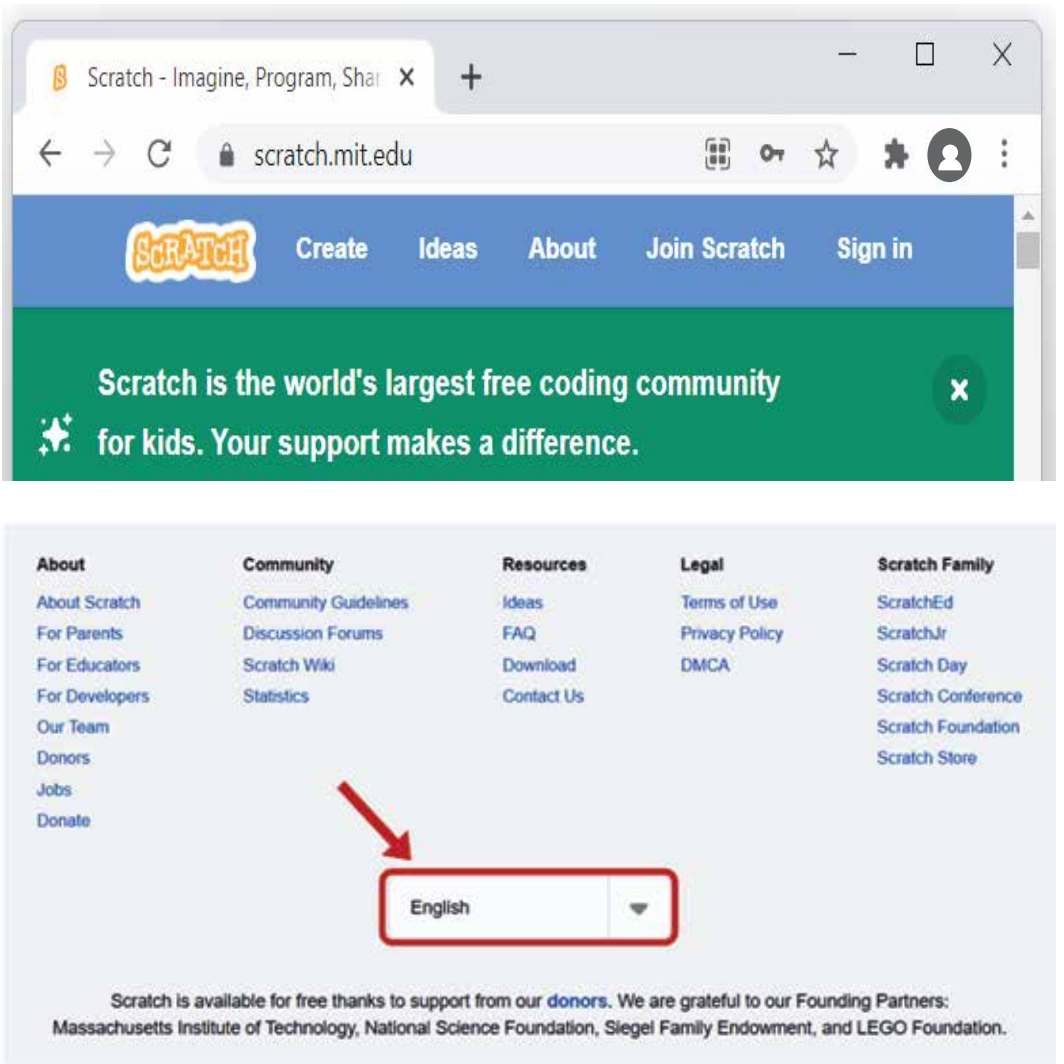
Sprite



Background

Entering into Scratch and change of Language

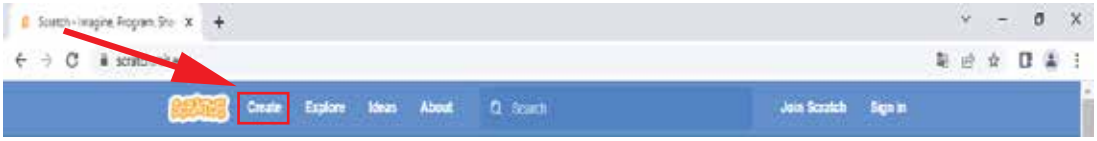
Open the computer and enter into the website of Scratch by writing scratch.mit.edu in the address bar. The website of the Scratch looks like the following picture. This is the homepage of Scratch. We can start the Scratch programme in Bangla by clicking at the place marked by the red arrow.



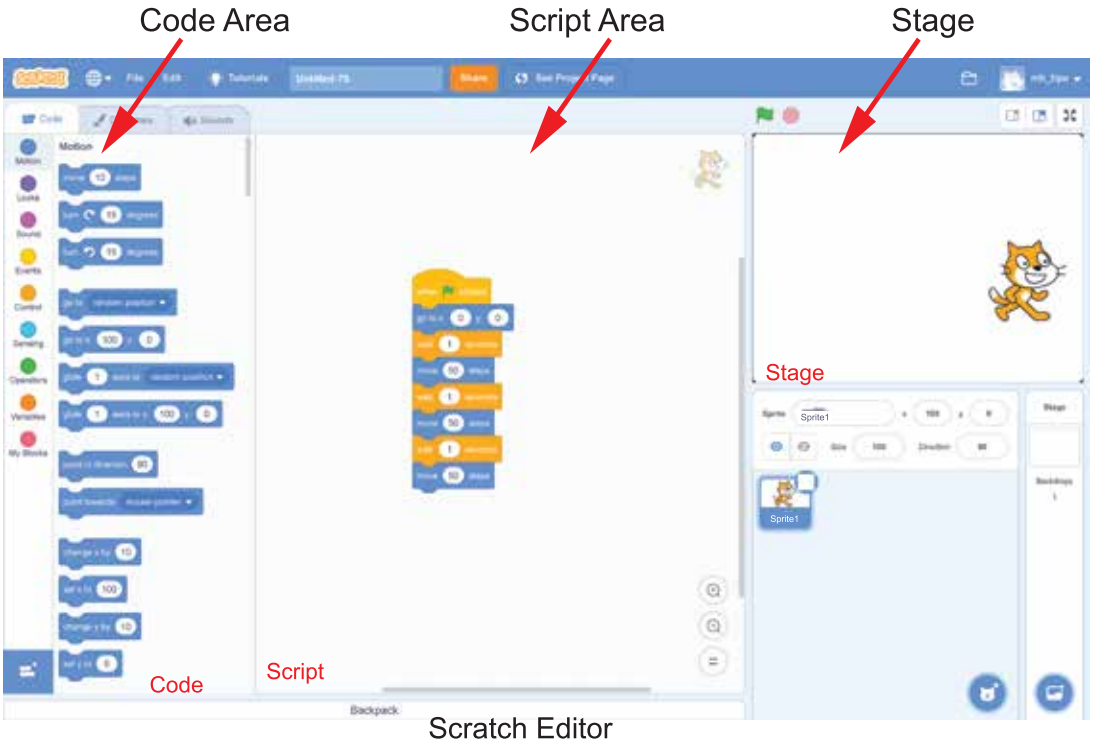
Homepage of Scratch

Elements of Scratch

To create a new programme in Scratch, click on the button, 'Create' in the Homepage in Bangla.



After clicking the Scratch Editor, following image will be seen. The Editor page has three parts or elements. For example, Code Area, Script Area, and Stage.



Scratch Editor

The left side of Scratch Editor is code area where different types of block-codes are available. For different types of activities, different types of coloured block-codes are used. To complete a particular activity, different block-codes are arranged sequentially in the Script area situated in the middle of the editor. The task become visible in the Stage at the extreme right side of the Editor as per the arranged block-codes in the Script Area.

Introduction of Block-Code

There are nine types of block-codes. The color of these block-codes are different as per their activities. The activities of block-code can be defined with its colour. The block-codes are described in the following table:

List of Block-codes with description

	Types of Block-codes	Description
1	Motion	Related to change of speed and position of Sprite
2	Looks	Related to different usages of looks and controls of Sprite
3	Sound	Use of different sounds
4	Events	Determining the actions according to the events
5	Sensing	Determining the actions related to click, touch etc.
6	Operators	Mathematical operations and comparison of different standards
7	Variables	Variables, lists and their usages
8	My Blocks	Create own functions as per your requirements
9	Control	Verifying of different conditions and usages of loops

First task in Scratch

By now, we have learnt that any task can be completed arranging different block-codes serially in the Script Area of Editor. As a first task, we will carry forward a Sprite with a few steps ahead.

Activities: Carry the Sprite forward

we will see a Sprite in the Stage after opening the Editor

What to do:

1. Start the Scratch Editor
2. Clicking the 'Event' in the code-area, drag the block-code into Script area. 

3. Similarly, drag the block-code 

into Script Area clicking 'Motion' and add to the previous block-code.
4. 

In the white area of the block-code set the number of stages as you wish.
5. Click on the green flag at the top of the Stage.
6. Follow the movement of the Sprite.
7. Let's discuss about the task with the classmates.

Summary

We have learnt that a particular task can be done arranging the different block-codes in Scratch. This means a program. We can solve different problems using block-codes through programming, and following logical instructions.

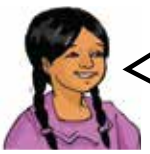
We make plan for doing any task. According to the plan, we follow some rules sequentially to do the task smoothly. Let us play the game following the rules stated below:

Activity: Calculate and catch the number

What to do:

1.Let's stand in circle like the following picture.

2. Select a number at the beginning of the game, for example, 24.
3. Allow each of the member of the team to throw 3 dices at a time serially.
4. Let us calculate the numbers derived from the dices using any of the 4 processes (+, -, x, ÷).
5. Let us calculate every number of the team. But let us allow the student to calculate who has thrown the dice.
6. After throwing the dices, the number of whom would be equal to the number set at prior of the game will be the winner, and they will go in the next round. Those will be eliminated from the game whose number will not match.
7. If the winner is more than one, play the game again selecting another number. There will be a single winner in the final round.



The game is exciting. By the game we can achieve the competency of addition, subtraction, multiplication, and division.

The game of calculating without pen and paper is really exciting.

Discussion

- **Let's think over the following topic:**

1. What factors have to be considered for being winner in the game 'Calculate and catch the number'?
2. What have we learnt from the game?

EXERCISES

1. Fill in the blanks.

1) Information and _____ Technology makes our lives easier.
2) People used to draw picture on cave wall or used _____ to store information.
3) The use of information includes the activities like collecting, storing, and _____ information.

2. Put a tick mark (✔) on the correct answer.

1) Which one is a modern technology for communication?
   a. smoke signals b. the internet
   c. career pigeon d. drums

2) Which one is the best way to collect the information on your friend's experiences?
   a. listening to the radio b. watching a TV
   c. reading a book d. asking your friend

3) By what a "Sprite" is controlled?
   a) Editor
   b) Backdrop
   c) Stage
   d) Block-code

4) Which one is the part of Editor?
   a) Home page
   b) Code Area
   c) Backdrop
   d) Sound

5) Which one of the below have to be clicked to operate a programme?
   a)  b) 
   c)  d) 

3. Short Answered Questions.

1) Give four types of fields in which ICT is used.
2) When you share the information with someone, what points should you pay attention to?
3) Give four examples of sources of information.
4) What is Sprite?
5) What are the elements of Editor?
6) What is the function of Block-code?

4. Descriptive Questions.

1) Explain four steps for a wise use of information.
2) Explain how we can store information.
3) Write down the steps to move a Sprite forward.

5. Match the words on the left with the words on the right.

communication technology	television
recording technology	observing
source of information	camera
a way of collecting information	telephone

Chapter 13

Population and Natural Environment

Nature and people have close relation between them. People need natural resources to live. Population of the world is increasing continuously. However, the resource of world is limited. If this situation continues, what will happen to natural resources?

1. Relationship among Population, Shelter and Food

QUESTION : What is the relationship between a growing population, and needs of food and shelter?

Activity: Relation between Population, food and shelter

What to Do:

1. Make a table like the one shown below.

	(1) how much rice do we need?	(2) how much space do we need?
number of people		
1	120 Kg	10 m^2
10		
100		
1000		
10000		

2. A person eats rice about 120 Kg a year. If the number of people increases like 10, 100, 1000, and 10000, how much rice do we need? Calculate and complete the blanks in the column of (1).
3. If a person needs 10m^2 of space, how much space do we need when the number of people increases like 10, 100, 1000, and 10000? Calculate and complete the blanks in the column of (2).
4. Share your ideas with your classmates.

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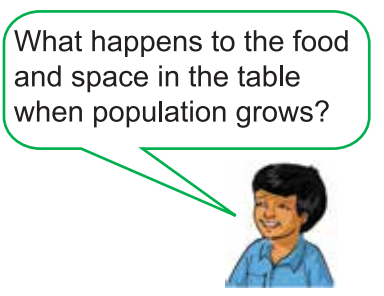
Results

number of people	(1) how much rice do we need?	(2) how much space do we need?
1	120 Kg	10 m^2
10	1200 Kg	100 m^2
100	12000 Kg	1000 m^2
1000	120000 Kg	10000 m^2
10000	1200000 Kg	100000 m^2

From the table, we can find the relationship that we need more rice and space when the number of people increases.

Discussion



◆ **Think about the following points.**

1. What is the relationship between growing population, and needs of food and space?
2. Share your idea with your classmate

Summary

People need food and space to live. The more population grows, the more food is necessary. A growing human population will take up more space to build a shelter. If the human population continues to grow, not enough food and space will be available.

Large population needs more food to eat and space to build shelter

2. Impact of Population Growth on Natural Resources

QUESTION : What is the impact of population growth on natural resources?

Activity : Population Growth and Natural Resources

What to Do :

1. Make a table like the one shown below.

(1) what we make or need	(2) natural resources we use
e.g. making houses	e.g. soil, wood, rocks

2. What will we make or need if the population increases? Make a list in the column of (1) in the table.
3. When we make or need something, what natural resources will we use? Make a list in the column of (2) in the table.
4. Share your idea with your classmates.

Discussion

◆ **What are the harms increased population caused?**

1. See the picture below.
2. Share with your classmate about how people causing harm to the environment.

Summary

Human population has been steady growing. One of reasons is there are more great advances in science and technology. Advances in science and technology can make it possible for people to produce enough food and to develop medical technology to survive diseases and accidents. Now people can live longer.

Impact of Population Growth on Natural Resources

The growth in human population needs more food, shelter, land, energy, and other resources. However, the natural resources are limited.

soil erosion

landslide

To get more natural resources, people have destroyed and changed the natural environment. For example, people have cleared forests for land to cultivate crops or livestock for food, and to build shelters and roads.

The loss of forests causes the destruction of the habitats of plants and animals and its extinction. It also can cause soil erosion and landslides. The environmental change can affect the changes in rainfall and temperature, and cause different types of natural disasters such as flood, drought, and storm.

flood

EXERCISES

1. Fill in the blanks.

1) People need more ____ and space if population continues growing.
2) Human population has been growing because of great advances in science and _____.
3) To get more natural resources, people have destroyed and changed the natural _____.

2. Put a tick mark (✔) on the correct answer

1) What is the relation between population growth, place and food?
   a. Increase of food production will increase place and population
   b. Population growth increase the demand of place and food
   c. Population growth decrease the demand of place and food
   d. Population increase does not affect the demand of place and food

3. Short Answered Questions:

1) What will happen due to loss of forests?
2) How could people are destroying forests?

4. Descriptive Questions:

1) Explain the relationship between a growing population, and needs of food and shelter.
2) What are the impact of the advancement of science and technology on population ?
3) What are the impacts of growing population on natural resources?

5. Match the words on the left with the words on the right.

destroying habitat	drought
using natural resource	extinction of living things
natural disaster	people getting long lives
development of medical technology	environmental changes

Glossary

Terms	Meaning of Terms	Page No.
accident	Anything that happens by chance and causes damage or injury.	79
bacteria	A tiny, simple creature can not be seen with naked eyes that get nutrients from their environments in order to live. Some types of bacteria can make us sick.	37
balanced diet	A diet that contains adequate amounts of all the necessary nutrients required for growth and activity.	31
burn	Injury to the body caused by heat. When we touch flames or hot objects such as stove, fireplace, or cloth iron, we get burned.	81
calcium	A mineral vital for building strong bones and teeth.	32
climate	Usual weather pattern of a long period of time	76
cloud	Water vapour condenses on a tiny dust particle and form a small water droplets that float in the sky.	73
communication technology	The technology to communicate with people.	90
compost	A mixture that consists of organic matter and is used for fertilizing and conditioning land.	24
conservation of natural resources	The preserving and wise use of natural resources.	53
constellation	A pattern of stars with shapes like an animal, person, or object.	60
crop rotation	The practice of growing different types of crops in the same area in sequential seasons.	24
(℃)degrees celcius	A unit of measuring temperature where water freezes at 0 degree and boils at 100 degree.	76
desert	A place with very little water. a desert is mostly covered with rocks or sand.	17
digestion	The process by which food converts into simple and absorbable from in animal body.	9
drought	A dry weather condition due to low or no rainfall for a long period of time.	

energy	The ability to do things.	51
energy resource	Anything that can be used to produce energy by the people.	52
equator	An imaginary line running around the widest part of the Earth, halfway between the North Pole and the South Pole.	76
extinction	The dying out or termination of plants or animals	19
fertilizers	Elements that are most important in plant nutrients. It can help soil restore lost nutrients.	24
first aid	Emergency care or treatment given to an ill or injured person before medical services arrive.	83
flood	Overflowing river water on to the land during rainy season.	74
fog	A kind of clouds that you can feel or touch at the ground.	73
fossil fuel	A fuel such as coal or oil that is formed in the earth from dead plants or animals.	52
galaxy	A huge group of stars and systems.	59,60
generator	A device that converts one form of energy into another form especially electric energy.	52
habitat	The part of an environment where a plant or an animal lives.	3
healthy eating plate	A list of food conatins proper amount of carbohydrates, proteins, fats, minerals and vitamins for good health.	32
hemisphere	A half of the Earth	77
humidity	A measure of how much moisture is in the air.	69
hygiene	Keeping ourselves and our surroundings clean in order to maintain good health.	35
Information and Communication Technology (ICT)	The technological tool used to communicate, and to create, provide, and store information.	88
landfills	Areas where garbage is placed in the land.	22
lithograph	A printing on a stone or a metal plate.	90

latitude	The distance from the equator.	76
matter	Anything that has mass and takes up space.	40,43
mineral	A solid material that is found in nature.	49
natural resource	A material found on the Earth that can be used by people.	9, 48
non-renewable resource	A natural resource that can not be replaced for millions of years once it has been used up.	50
nutrition	A substance that living things need in order to survive and grow. There are five nutrients; carbohydrates, proteins, fats, vitamins and minerals.	27
ocean	A large reserviour of salty water.	18
Predator	An organism preying on others.	3
pneumatophore	A specialized root that grows upwards out of the water or mud to exchange gases in a saline environment.	14
phases of the Moon	The changing shapes of the bright part of the Moon that we see.	57
planet	A large object in space that moves around the Sun.	58
plant breeding	The scientific improvement of plants to change the traits of plants in order to produce desired characteristics.	66
population	The number of people who live in the same area.	94
protein	A nutrient that is used to replace, repair and grow our bodies.	30
programme	Logical arrangement of codes for problem solving	94
programming	The process of logical arrangement for problem solving	94
recording technology	The technology to make a record of information.	91
recycling	Remaking things into either the same kind of thing or new products.	26
reducing	Making something smaller, useing less, or resulting in a smaller amount of waste.	26
renewable resource	A natural resource that can be replaced by nature	50

reusing	Using materials again in their original form instead of throwing them away.	26
rock	A solid material made of one or more minerals.	49
oral saline	A liquid mixture of salt, sugar or molasses and safe water that can be used to replace liquid lost from the body.	38
satellite	An object that revolves around a planet.	58
shelter	A place where animals can be safe. It provides animals with protection from enemies or weather conditions.	3
soil conservation	A protection of soil from erosion, or the maintenance of soil fertility.	26
soil erosion	The washing or blowing away by wind or water of the top layer of soil.	26
soil pollution	The contamination of soil with harmful substances.	25
solar panel	A device that change sunlight into electricity.	52
solar system	A system that is made up of the Sun, all the planets that move around the Sun, and other objects such as asteroids, comets, dusts, and gas	58
star	A huge ball of burning gases that gives off light, heat, and other energy.	60
Scratch	A Popular programme.	94
Sprite	Cartoon character of serach.	94
technology	A tool or process that makes our life better, easier and very comfortable.	62
telegraph	A machine that is used for transmitting messages in the form of electrical signals.	90
temperature	A measured of how warm or cold the air is.	69
the Moon	A space object that move around the Earth.	57
universe	Everything that exists, including galaxies, stars, planets, space, all matter, and energy.	60
vitamin	A nutrinet that helps make our body work properly, strengthen the immune system, support growth, and help our body parts do their jobs.	29
volume	An amount of space that matter takes up.	41

waterborne disease	A disease caused by taking water contaminated with germs.	36
weather	The condition of what the sky and air like each day.	68
weight	A measure of how strongly the Earth pulls a matter to the centre of the Earth.	43
wind	Moving air.	69
woodland	A place with many trees and bushes growing naturally.	17

End

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