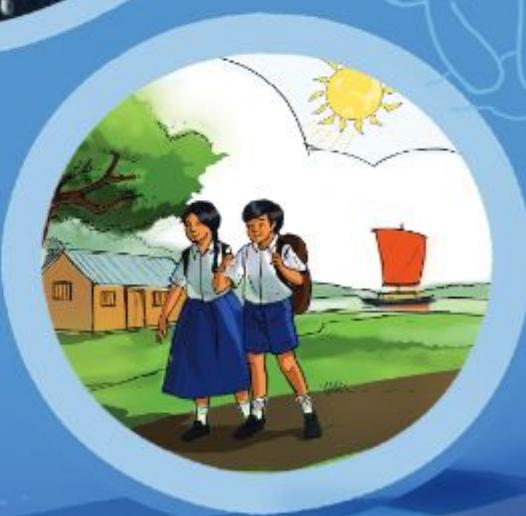


Elementary Science

Class Four



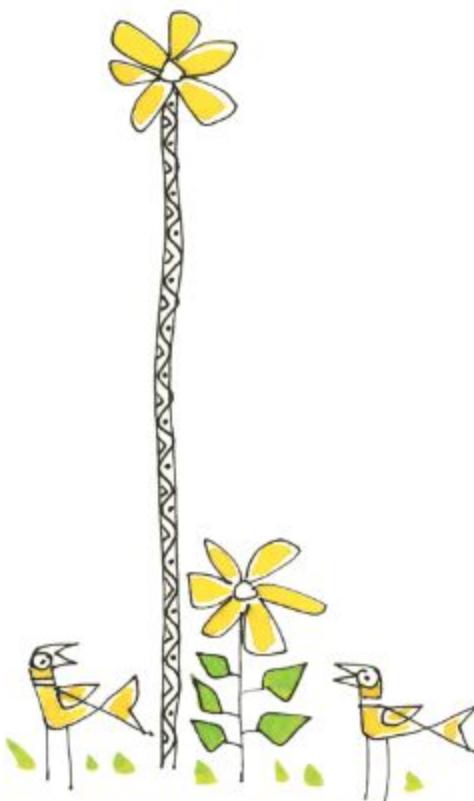
National Curriculum and Textbook Board, Bangladesh

Prescribed by the National Curriculum and Textbook Board
as a textbook for class four from the academic year 2013

Elementary Science

Class Four

Revised edition for academic year 2025



NATIONAL CURRICULUM AND TEXTBOOK BOARD, BANGLADESH

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First Edition Writers and Editors

Dr. Ali Asgar

Dr. Md. Anwarul Huque

Quazi Afroz Jahanara

Mohammad Nure Alam Siddique

Art Editor

Hashem Khan

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Preface

Primary level constructs the foundation of education. A set of well-defined targets and properly planned primary education provide strengths to the entire education system. Keeping this in mind, the primary level has been given supreme importance in the Education Policy 2010. Increasing the span and inclusiveness of the primary level, as the developed countries of the world, have been emphasised. Special attention has been given to ensure that no child's access to education is hindered by social and economic status, religion, ethnicity, or gender identity.

The National Curriculum and Textbook Board (NCTB) has implemented an integrated curriculum to update primary education. While this curriculum trails the pedagogy and the curriculum of developed countries, it also adopts traditional teaching-learning values of Bangladesh at the same time. This has enabled the education to be more life-oriented and productive. In the context of globalisation, the mental health of the children has also been specially considered in this curriculum.

Textbook is the most important component of curriculum implementation. NCTB has always borne that in mind while designing textbooks for all levels and classes including primary level. Curriculum goals and objectives have been prioritised in the writing and editing of each book. A keen eye has been kept on the diverse curiosity and capacity of the child's mind. Special importance has been given in designing the curriculum and textbooks to make teaching-learning interactive and enjoyable. It is hoped that each book will help in the balanced psycho-physical development of children through educational activities. It will support in acquiring the required skills, adaptability, patriotism and moral values at the same time.

The textbook Elementary Science has been designed as a compulsory subject at the primary level. It includes necessary explanations, images, and examples to present scientific topics in a simple and engaging way. Special emphasis is placed on integrating science and technology to foster human resources capable of leading the Fourth Industrial Revolution. Additionally, the textbook prioritizes two main aspects of science education: acquisition of information-rich knowledge and participation through asking questions, experimenting and verifying data and theories.

Special thanks to the specialists and teachers who worked intensively in writing, editing and revising the textbook. Thanks to those also who have made the textbook attractive to children through its design and illustration. This textbook, written under the curriculum 2012, has been revised to address the need in the changed context of 2024. Due to time constraints, some errors may still exist. Any constructive advice and guidance from the audience will be considered with due importance.

At the end, I wish every success of the learners for whom the book has been produced.

October 2024

Professor Dr. A K M Reazul Hassan

Chairman

National Curriculum & 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.

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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!

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 :

Let's ...

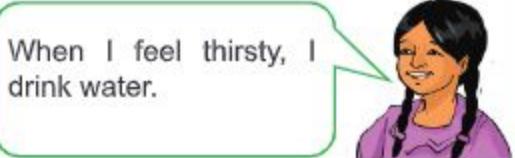
1. make a table like the one shown below.

| 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

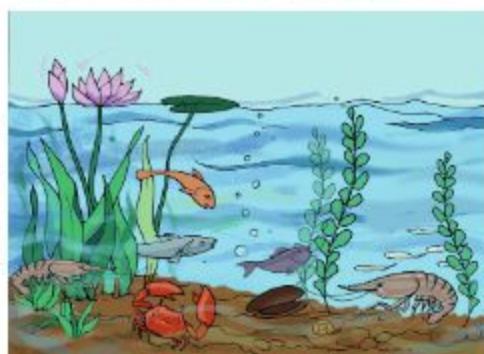
Animals have to take food to get nutrition and energy for survival. They get food from plants or other animals in the environment. Plants also need energy and nutrients but they do not take food as animals do. Plants can make their own food by themselves.

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



Many living things live in water

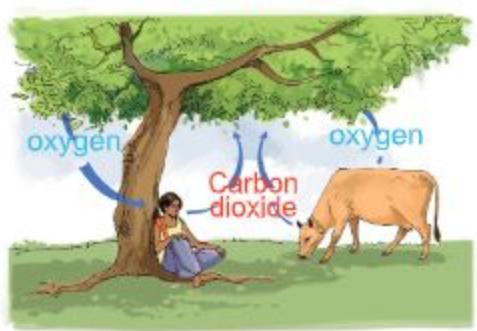
Water

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.

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

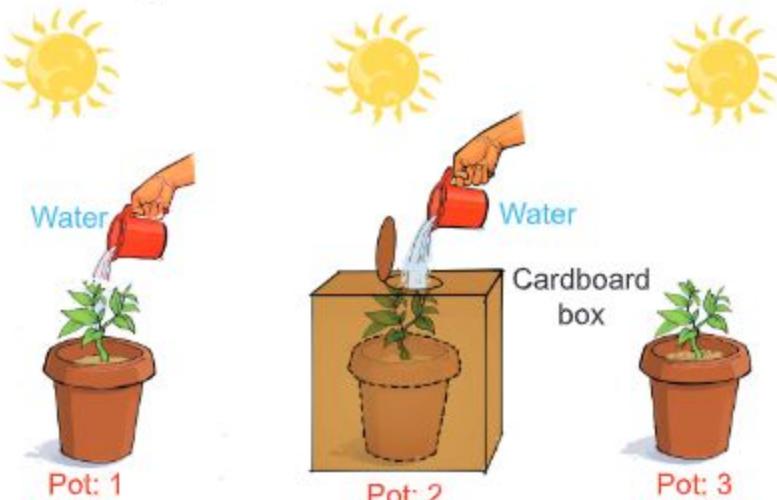
What to Do :

Let's . . .

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 the ideas with 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 seedling has died. |



Discussion

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

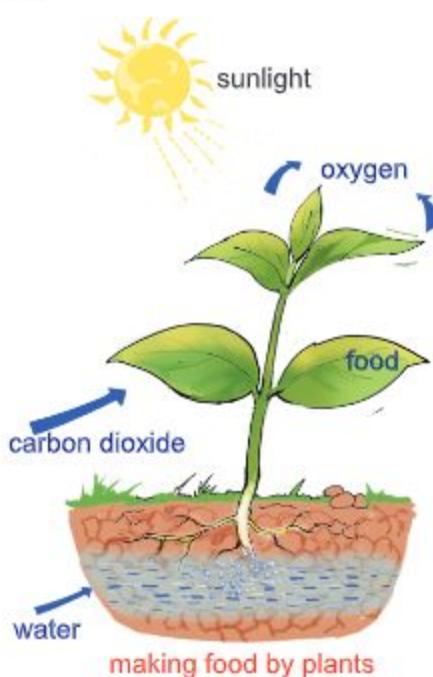
- (1) What condition is different between the pot 1 and pot 2?
- (2) Which seedling has grown well - pot 1 or pot 2? Why?
- (3) What condition is different between the pot 1 and pot 3?
- (4) Which gram has grown well - pot 1 or pot 3? Why?
- (5) What elements do plants need to grow?

Summary

Plants cannot live without sunlight and water.

Plants produce their necessary food from water and carbon dioxide in the presence of sunlight. Plants' food is mainly carbohydrate. Most of the plants' food is produced in their leaves. Through their roots, plants absorb water required to produce food. On the other hand, they receive carbon dioxide from the air. Plants release the oxygen produced in this process to the air. Plants get necessary energy from their self prepared food for survival and growth.

To make their food plants need sunlight, water and carbon dioxide from the air.



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 :

Let's . . .

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 classmates.

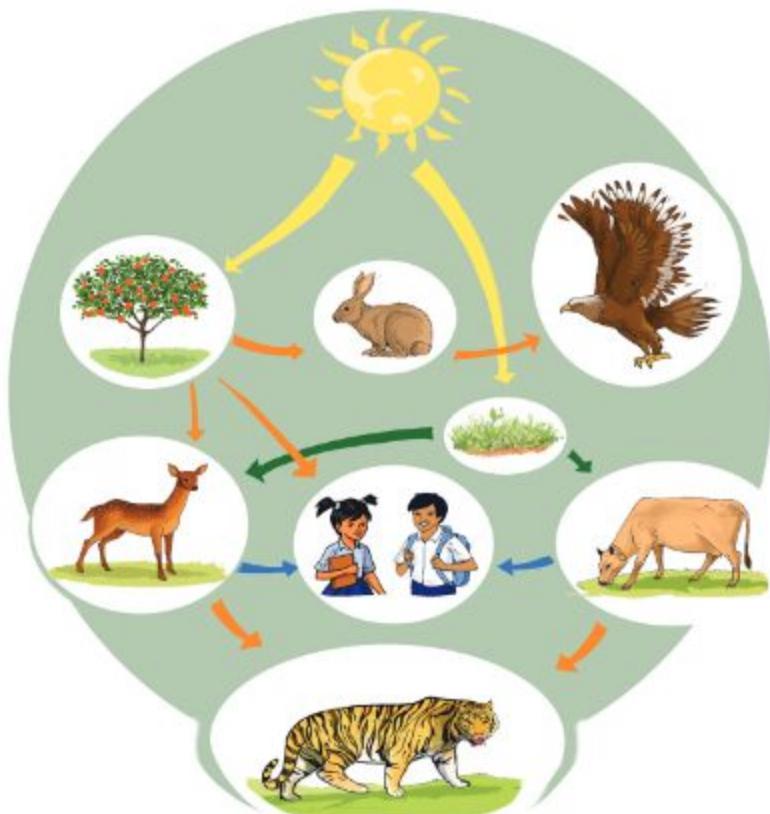


Summary

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

Energy passing through food

All living beings need energy to survive and grow. Plants produce their own food from water and carbon dioxide in presence of sunlight. This food supplies necessary energy to plants. Plants get this energy from sunlight. Animals cannot produce food by themselves. They must consume plants or any other animal as food to survive. In this way, energy passes through food. The prime source of energy is the sun. This energy flows into plants' body while producing their own food. Then, energy is transferred and stored into the animal's body when animals consume plants or vegetative parts.



3. Changes in the environment

QUESTION : What causes environmental changes?



Activity : How has the environment been changing?

What to Do :

Let's . . .

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 the ideas with classmates.



before development



after development



Discussion

Let's . . .

◆ Think about the following points based on the table made above.

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

Summary

The causes of environmental change

The normal condition of the environment changes because of natural disasters and various human activities. Natural disasters such as

drought, flood, storm, earthquake change the environment. Humans have been continuously cutting down trees to use as fuel and building materials. Besides, they are filling up hills, hills, haors and making unplanned roads and barrages on haors. Again, they are destroying forest by cutting down trees to grow crops and to make farms, houses, road-streets and factories. Humans are also changing the environment to extract various kinds of natural resources.



human clear forests to build roads



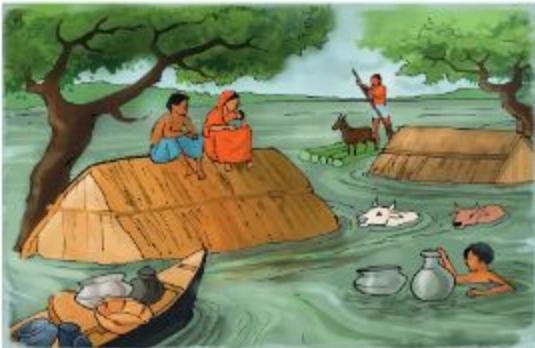
humans cut trees for fuel and furnitures



storm changes the environment

The effects of environmental change

Various types of environmental changes occur due to different factors. These overall changes cause climate change. One of the examples of this change is temperature rise. Similarly, climate change causes natural disasters like untimely rainfall or reduced rainfall, drought, tidal surges, salinity and floods. Natural disasters cause serious damage to the lives and habitats of humans and all living beings.



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 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 |
|--------|---------|-------|---------|

Plants and Animals

1. Differences between plants and animals

Plants and animals are both living Can you see any differences? 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:

Let's ...

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 the ideas with 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 :

Let's . . .

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 the ideas with classmates.



Summary

Habitat of Plants

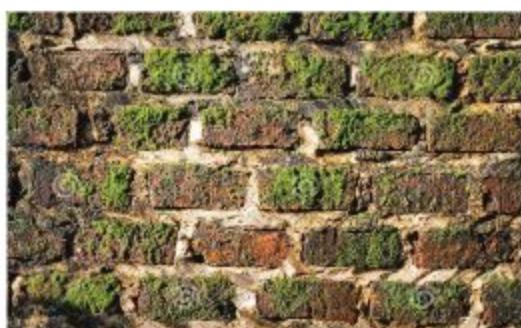
Plants need suitable habitats for survival or normal living. So, habitats are different based on the plant species. Some plants like mango, berry, jackfruit etc. grow in bright sunny places. Again, some plants like mosses and ferns grow in shady, moist and cold places. Some other plants like mango trees and berry trees grow in lands. Again, plants like water hyacinth and water lily grow in water. On the other hand, kalmi and helencha etc. can grow in both environments- water and lands.



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 :

Let's . . .

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 the ideas with 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

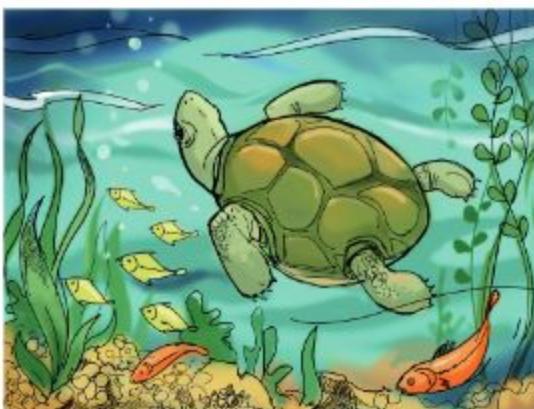


underground habitate of different animals

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

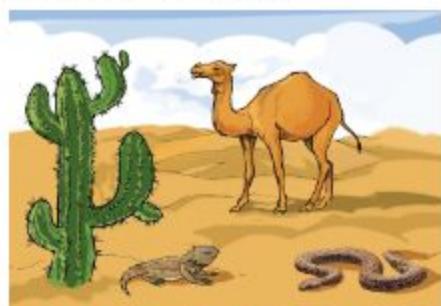


birds make nest in trees

(3) Diversity of plants and animals based on habitat

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.



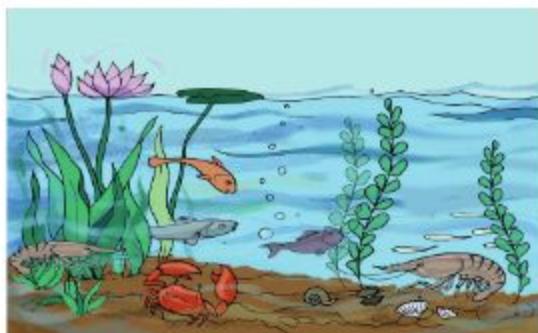
desert habitat

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 emerged where various kinds of plants grow naturally in plenty. For example- the Sundarbans and the Sal Forest. Sundari, geua, goran, golpata etc. are plants growing in forest habitats. Forests are also the habitats of various animals like the Royal Bengal Tiger, deer, fishing cat, wild cat, monkey, birds, etc.

Aquatic 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.

Marine 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?

Let's ...

- make a table like the one shown below.

| Habitat | Plants | Animals |
|---------|--------|---------|
| Desert | | |
| Forest | | |
| Wetland | | |
| Ocean | | |
| Polar | | |

- make a list of plants and animals that live in each habitat in the table.
- share the ideas with classmates.

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 food, water and shelter from the environment to survive. They depend on each other.



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?

Let's . . .

- make a list of the causes of environmental changes in the table shown at your right.

| natural causes | human causes |
|----------------|--------------|
| | |
| | |
| | |

- share the ideas with classmates.

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 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 water hyacinth lizard monkey | desert pond forest 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 :

Let's . . .

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 the ideas with 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.



pottery

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.



burying trash with soil

Landfills

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

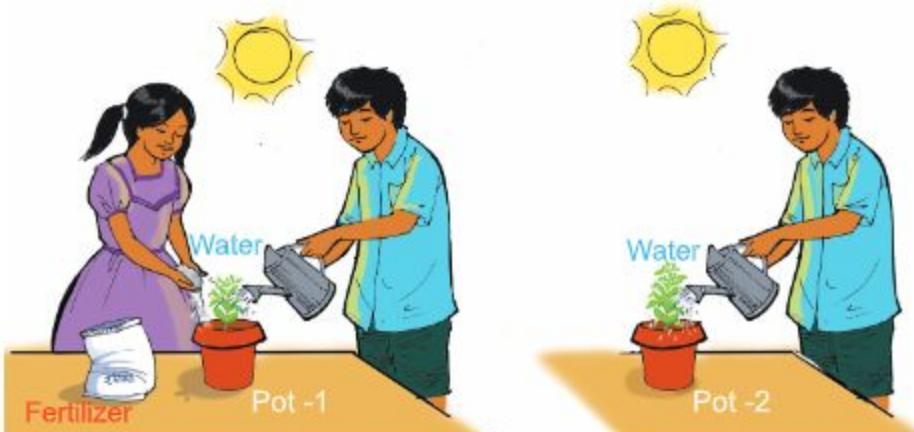
What to Do :

Let's . . .

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 the ideas with 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.



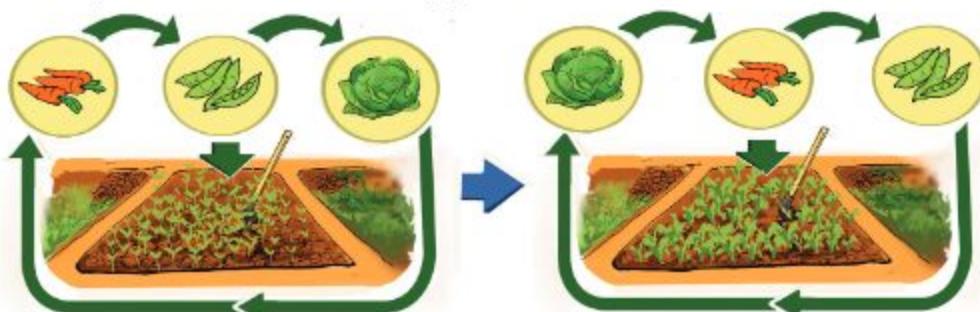
organic fertilizer : compost



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 :

Let's . . .

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 the ideas with classmates.



Discussion

◆ What can we do to prevent soil pollution?

1. Let's share the ideas with 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) dumping 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 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 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 specific 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 :

Let's . . .

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 the ideas with classmates.

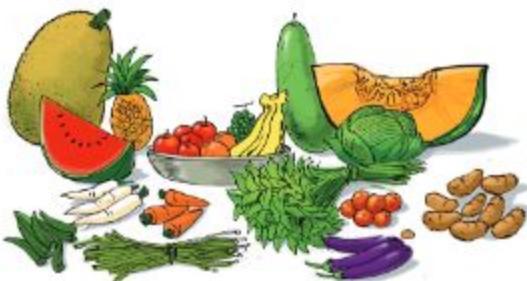
Summary

Food from plants

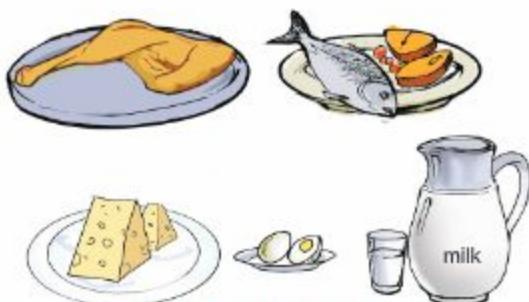
We get most of our food from plants. Plants give us vegetables, fruits, grains and pulses as food.

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 to do their functions. 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?

Let's . . .

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 the ideas with classmates.

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.

| plant proteins | animal proteins |
|----------------|-----------------|
| | |

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



Activity : Selection of easily available and low priced balanced diet

What to Do :

Let's . . .

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 the ideas with 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, fresh and covered to maintain food safety.

Summary

Food Types

All types of food belong to different groups. There are many kinds of food in nature. These food are classified into many groups. To stay healthy, we should eat the right amount of nutritious food from all types according to daily need of our body. This includes a balanced mix of all kinds of food items to meet our body's needs. We can get all nutrients from a variety of foods in each of these food types. Balanced diet

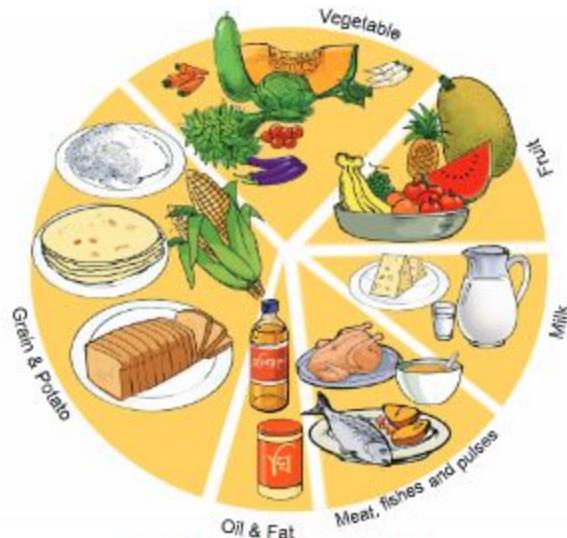
contains an adequate amount of all the necessary nutrients. We can select a balanced diet easily from the available low-priced variety of food.

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. |
| Dietary fiber | fiber | different types of vegetables, fruits, manually husked rice 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 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 |

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 :

Let's . . .

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 the ideas with classmates.



I take a bath every day
to keep myself clean.



I play football every
afternoon.

Summary

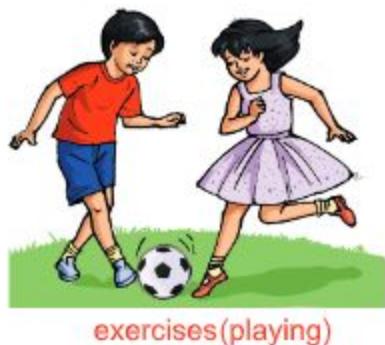
The best way to stay healthy is to follow the rules of good health and maintain a regular healthy lifestyle. The followings are good habits to keep our body healthy.

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.

Regular exercises

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



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 should 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.



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.



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:

Let's . . .

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 the ideas with classmates.

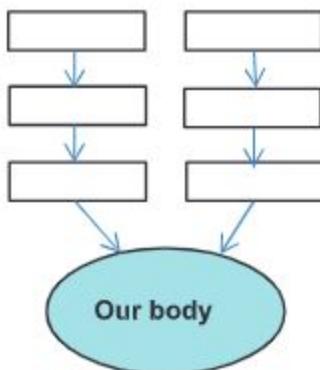




Discussion

◆ 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.

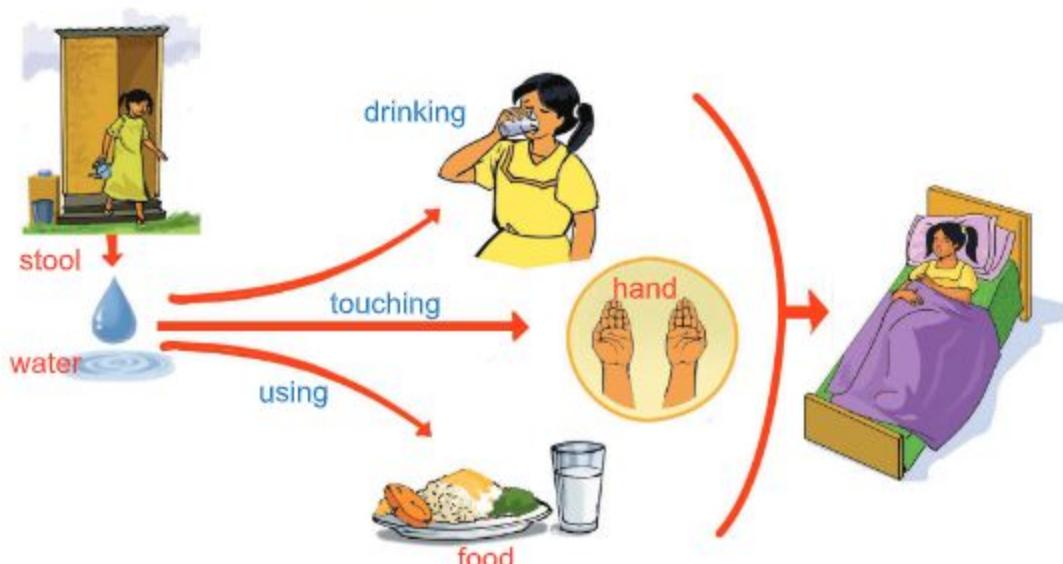


Summary

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



1. wet your hands



2. using soap



3. scrub hands for 15-20 second



4. rinse your hands



5. stop tap after washing your hands



6. dry hands with clean cloths or tissue

how to wash hands

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.

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? |
|-----------------|
| |
| |
| |

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 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 toilet clean relieve from stress personal hygiene | keeping our body neat and clean relieving diarrhoea preventing waterborne disease 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

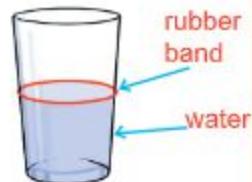


Activity : Properties of Matter : Part 1

What to Do :

Let's . . .

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

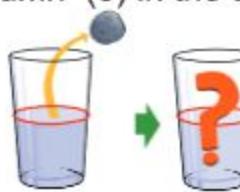


| | (1) Before putting stone | (2) After putting stone | (3) After removing stone |
|-------------------------|--------------------------|-------------------------|--------------------------|
| The level of water line | | | |

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



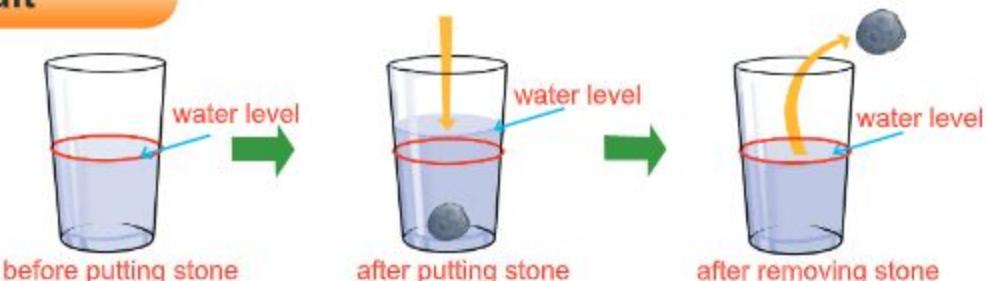
Discussion

Let's . . .

◆ **Think about the following points based on 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



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 matter takes up space of water in the glass.

Summary

Matter occupies space. For example, a textbook occupies a space on a desk. The area of space that matter occupies is called volume. Volume is a property of matter.



Matters take up space on a desk.

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



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:

Let's . . .

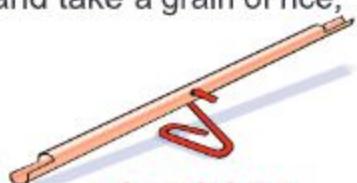
1. prepare a straw beam balance, and take a grain of rice, and a piece of staple.



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 the ideas with 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 any object to one end of a balance, the balance will tilt towards the object even though the object is small. This result shows that matters have weight on the Earth.

Summary

The total amount of matter inside an object is called the mass of that matter. The force with which the earth attracts that object towards itself is called the **weight** of that object.

The unit of measuring mass is gram or kilogram (kg). And the unit of measuring force is newton.



General properties of most of the matters:

- Matter takes up space
- Matter has weight



a scale



a balance

2. What is Air?

We cannot see air but air is all 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?

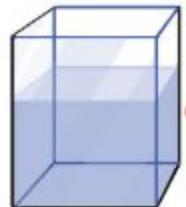


Activity : Properties of Air : Part 1

What to Do :

Let's . . .

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:

Let's . . .

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.



an inflated football



a deflated football

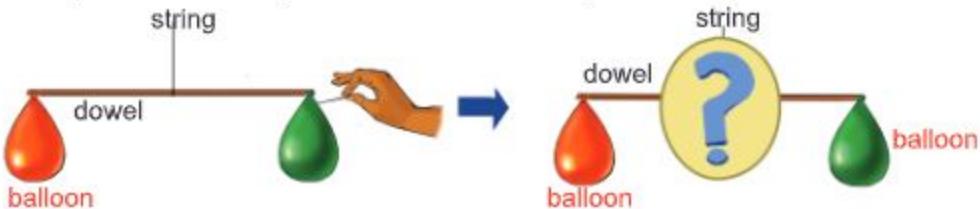
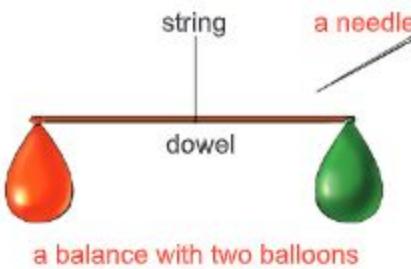


Activity : Properties of Air: Part 3

What to Do:

Let's . . .

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.
4. make the beam balance perfectly horizontal.
5. prick one of the balloons with a needle at its opening so that the air can pass out from it slowly.
6. observe what happens to the balance and the balloon.
7. keep a record of your observation in your exercise book.



Discussion

Let's . . .

◆ think about the following points based on the activity of Part 1.

1. What happened to two glasses? Why?
2. From this result, do you think what property air has?

◆ think about the following points based on the activity of Part 2.

1. What did you feel and observe when you played with two balls?
2. From this result, can you find what property air has?

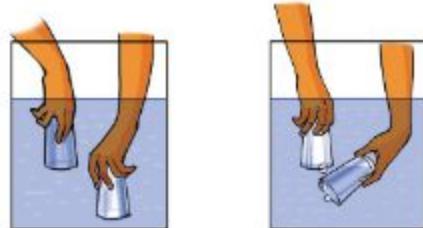
◆ think about the following points based on the activity of Part 3.

1. Does the beam balance stay balanced? Why or why not?
2. Which side is heavier? Why?

◆ find what properties does air have from the above three activities?

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.

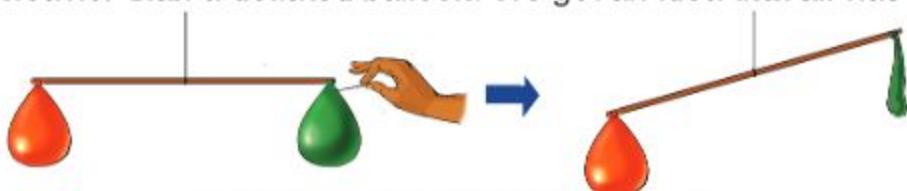
When we hit and press an inflated ball, we feel a resistance from the ball. On the other hand, when we hit and press a deflated ball, we do not feel a resistance because there is no air in the ball. From this result, we find that air can oppose against a pressure.

pressing a ball



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 towards itself.
- 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 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?

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 :

Let's . . .

1. make a table like the one shown below.

| objects | materials used to make it |
|------------|---------------------------|
| text books | |
| jewellery | |
| House | |
| car fuel | |

2. make a list of the natural materials that make the object in the table.
3. share the ideas with 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 rain. 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.

Forest Resources

Forest trees are the main source of wood that we use in our daily lives. Woods i.e. trees are used to make building materials, furniture and paper. We also use trees as fuel to get heat energy.



We get different resources from Forest

Land Resources

We grow crops and raise livestock on land to get food. Again, we build our houses or buildings on land to live in. Soil is also used for making building materials and pottery.

Mineral Resources

Some natural resources such as rocks, minerals, oil, coal and natural gas are available under the ground. There are many kinds of minerals, such as gold, silver, copper and iron. Besides, limestone and marble are one kind of rocks. We use different types of rocks and minerals for making chalks, coins, and building materials. By burning oil, coal and natural gas, we get heat which is used for running factories, vehicles, cooking food and generating electricity.



A sailboat uses wind to move.

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.

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 mineral resources | 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 mineral resources 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. Natural resource does not run out and can be replaced by nature to use again is called a renewable resource. Sunlight, air, water, and plants are examples of renewable resources. On the other hand, natural resources that are depleted once used and can not be replaced even after thousands of years are called non-renewable resources. Natural gas, oil, coal, and minerals are examples of 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 : Let's . . .

1. make a table like the one shown below.

| natural resource | Types of energy obtained |
|------------------|--------------------------|
| oil | |
| natural gas | |
| sunlight | |
| wind | |
| water current | |
| coal | |

2. make a list of types of energy from natural resources in the table.
3. share the ideas with classmates.



Summary

People use some natural resources to get energy. Anything that people use to produce energy is called a source of energy. For example, sunlight , wind, water current, oil, coal and natural gas are sources of energy.

Sunlight

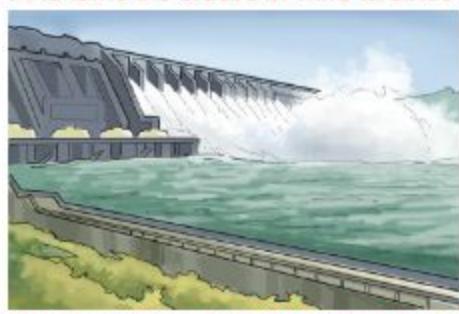
The sunlight is an important energy resource. People use solar panels to get energy from the Sun. Solar panels are devices that transform sunlight into electricity. We may have seen solar panels on the roofs of houses or on a calculator.



solar panels transform sunlight into electricity



wind turns the blades of wind turbines



water current from dam generates electricity



natural gas is used for cooking on stove

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

Water current is the most widely used energy source. The current of water turns the turbine connected to a generator and produces electricity.

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.

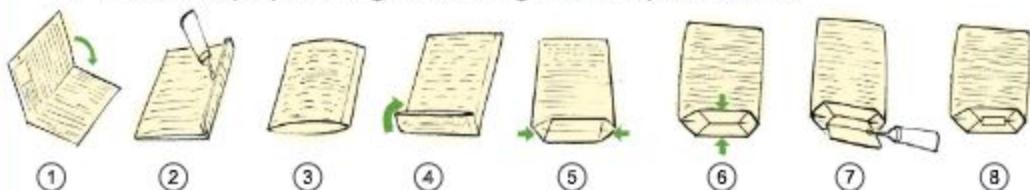
QUESTION : How can we conserve natural resources?



Activity : Making Paper Bag

What to Do : Let's . . .

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 the ideas with 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. We can conserve natural resources by reducing consumption of energy and producing less amount of trash. For example, we can turn out gas burner after cooking.

Reusing Resources

E) From the above activity, we have learned how to reuse resources by making paper packets from used paper. By reusing items, we can reduce waste and conserve natural resources. An item should be recycled or used multiple times before throwing away. If something is broken, we should try to repair it instead of throwing it away or buying a new one.



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 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 |

What do you see when you look at the sky? In the day sky, we see the sun and clouds. Again, in the night sky, we see clouds, the Moon and countless stars.

1. The Moon

QUESTION : How does the shape of the Moon change?



Activity : Observing the moon

What to Do : Let's . . .

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?

Each of the objects that rotates around the Earth is a satellite of the Earth. Among them, there is only one natural satellite; its name is Moon. Apart from this, thousands of artificial satellites are orbiting the earth. The Moon is a large round-shaped object made of rock. The Moon has no light of its own. We only see the Moon when the sunlight falls on the Moon. With the help of a telescope, we can see hills, mountains, valleys etc. on the Moon.



the surface of the Moon

Moon Phases

If we observe the Moon every night, we will see that the size and shape of the Moon is slightly different from the previous night. Sometimes the Moon appears large and round. Again, sometimes it appears small and half round shaped. This changing shape of the Moon's bright part is the phase of the Moon. Moon has eight phases or periods. The Moon returns to its previous phase after about 29 days and a half.



eight phases of the Moon

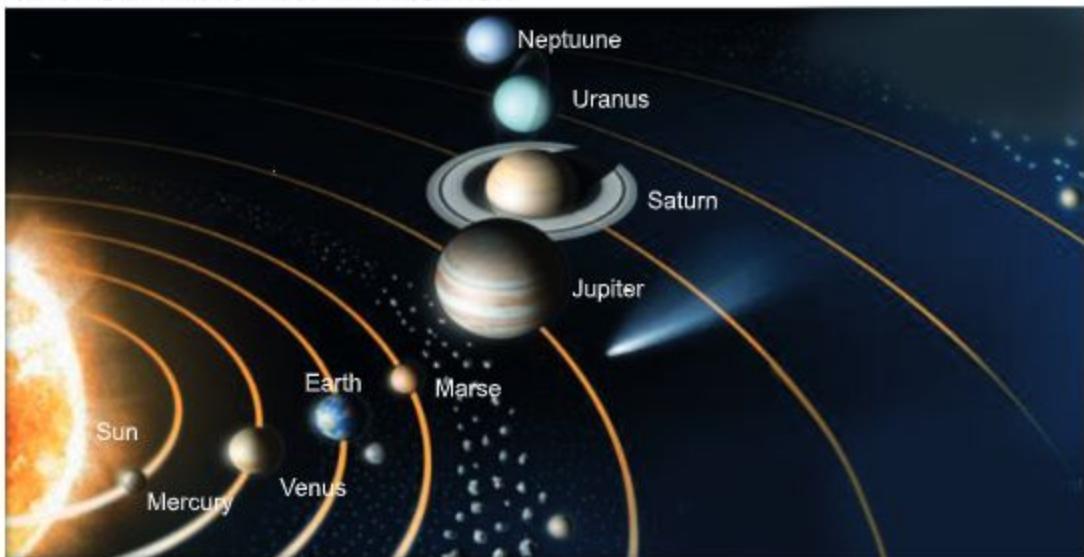
2. The Solar System

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 that rotate the Sun. Each of the large objects in space that moves around the Sun is a planet. A planet does not have its own light. Our Earth is a planet of the solar system.

Planets in the Solar System

There are eight planets in the solar system. The planets in order of their distance from the Sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Each of these planets except Mercury and Venus has one or more natural satellites.



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.

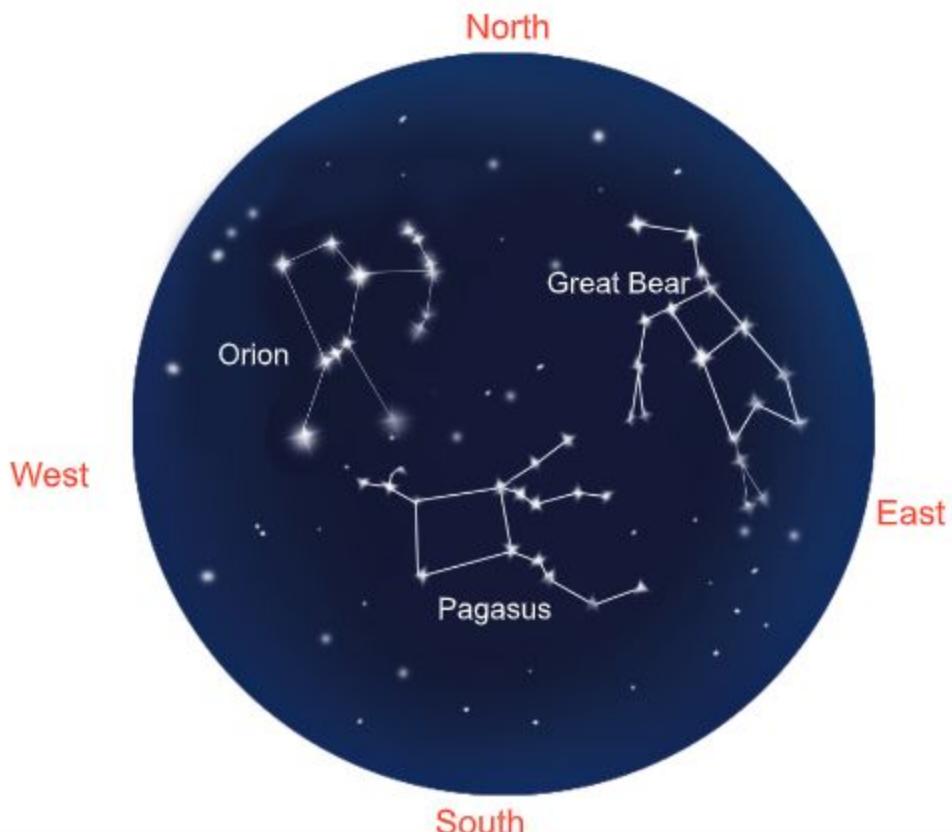
QUESTION : What is the galaxy?



Activity : Observing stars

What to Do : Let's . . .

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.

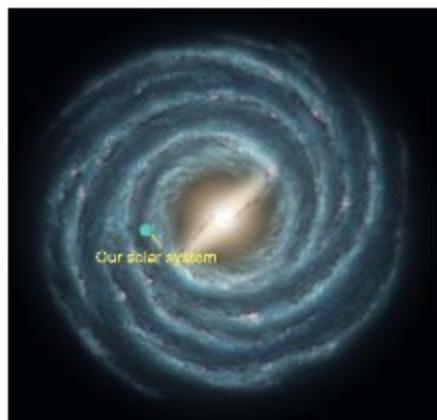
There are numerous stars in the sky. We observe that stars form patterns in the night sky. A pattern of stars with shapes like an animal, person, or object is called a **constellation**. Orion is such kind of a constellation.



the constellation



The Sun is a star.



Milky way galaxy

Galaxies

The Sun and the Sun's planets are parts of the Solar System. Again, the solar system belongs to a galaxy. A galaxy is a large collection of stars. The galaxy that the solar system belongs to is called the Milky Way. The stars or planets we see at night belong to this Milky Way. The Milky Way looks like a spiral.

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.

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 countless 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 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?

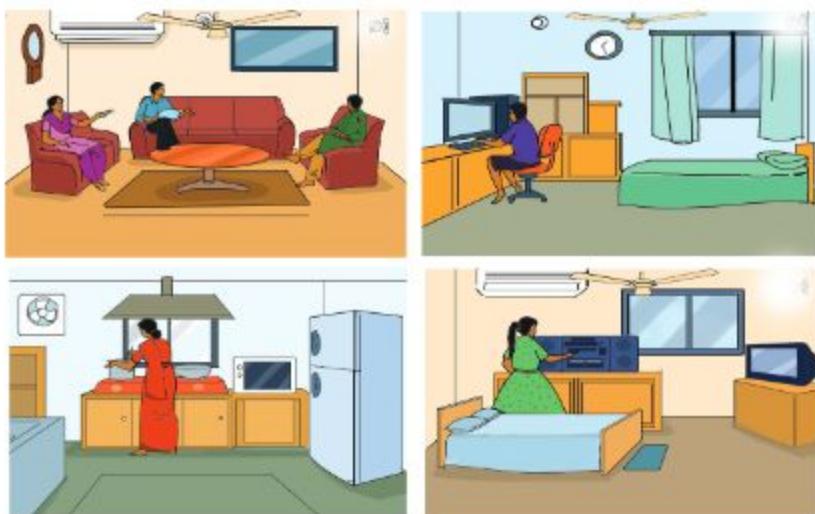
5. Match the words on the left with the words on the right.

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

Chapter 9

Technology in Our Life

By using tools or techniques for controlling the environment and finishing necessary tasks 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 technologies?



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: Let's . . .

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 the ideas with classmates.

Summary

We use technologies in different ways in our daily life.

Technology at Home

We can see the use of technology in different equipment at home. These include electric light, electric iron, electric fan, television, radio, mobile phone, computer etc. Technology is also used in kitchen equipment such as gas burner, refrigerator, rice cooker, microwave oven, etc.



computer



telephone



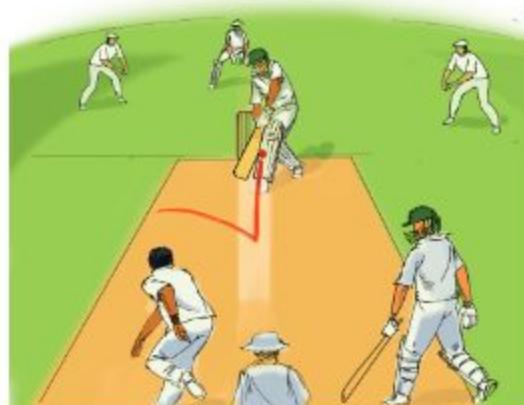
television

Technology in Sports

Many types of technologies are used in sports. Uses of technology in sports includes footballs, tennis rackets, cricket bats and balls, clothing and footwear. At present video cameras are also used in a variety of sports.



sporting equipments



using video camera in sports

Technology in Entertainment

We use various technologies for entertainment in our daily lives. Computer technology is one of them. Using a computer, we can play different kinds of games, watch movies or dramas and listen to music. Technology is also used in various musical instruments, such as the tabla, harmonium, guitar, violin, piano and drums, as well as CD and DVD players, etc. Additionally, amusement parks offer various types of rides, such as merry-go-round, roller coasters, etc. Besides, children's toys and drawing materials are also examples of the use of technology in entertainment.



musical instruments



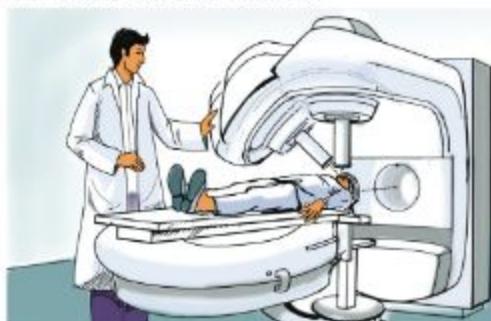
fun-park rides

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

2. Technology in Agriculture

QUESTION : How do we use technology in agriculture?



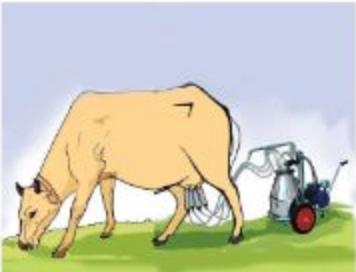
Activity : Uses of technology in agriculture

What to Do : Let's . . .

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 the ideas with 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 forest resource 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 Questions:

- 1) Write down the names of 5 sports materials in which technology is used.
- 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 |
|-------------------|---------------------|---------------|-------|

Weather and Climate

A weather forecast might say, 'The amount of rainfall may increase' or 'Light fog is likely' or 'A change in temperature is unlikely.' Weather describes the daily condition of the sky and atmosphere. For example, the sky might be sunny or cloudy and the air could be hot or cold, wet or dry.

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 : Let's . . .

- make a table like the one shown below.

| Component of weather |
|----------------------|
| rainfall |
| |
| |
| |

- make a list of components of weather in the table.
- share the ideas with classmates.

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.



Temperature

Some days we feel cold and other days we feel hot. Temperature describes how cold or hot the air is. We might say "A sunny hot day" or "A sunny cold day" when describing the weather. **fog**

Humidity

When the air feels wet and sticky, we describe the weather as humid. Humidity is the measurement of the amount of water vapour in the air. Higher humidity makes us sweat more easily. Again, low humidity makes the air feel dry. We use the terms "humid" and "dry" to refer to these weather conditions.

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 : Let's . . .

- 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 °C | | | | | |
| wind direction | north | | | | | |
| wind strength | mild | | | | | |

- observe the Condition of the sky, cloud, wind direction and strength, and write the information in your note book.
- measure air temperature and write down in your notebook.
- share the ideas with classmates.



Discussion

◆ Discuss the following questions in the class.

- Which weather component is changed most?
- Which weather component is the most important for our daily life?
- Can you relate any weather component to any incident?



Are there any relationships among weather components?

I think thick and grey cloud makes rain.



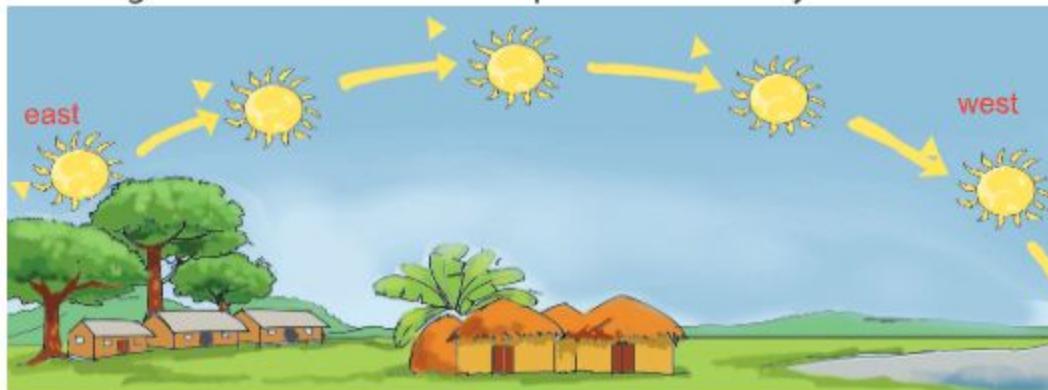
Summary

Weather is the temporary state of sky and air of an area. Weather is changing every day. We do not experience same weather all the time. Weather changes due to various factors.

Causes of weather Changes

(1) Temperature Change

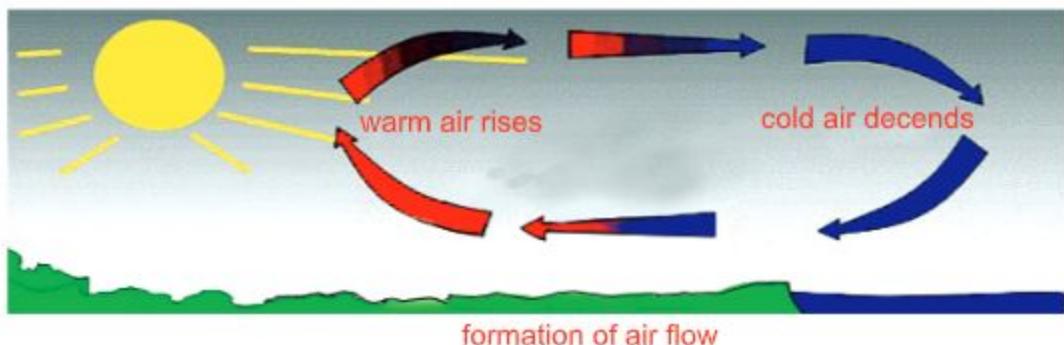
When the sun rises in the morning, air becomes warmer and temperature goes up. When the sun sets, the air becomes cooler and temperature goes down. This is called diurnal change of temperature. This change occurs due to the Sun's position in the sky.



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 make the sky clear by moving the cloud. The wind blows due to difference in temperature of two areas. Sometimes strong winds become storms or cyclones.



3. Cloud and Rain

QUESTION : How are clouds formed?



Activity : Making cloud in a plastic bottle

What to Do : Let's . . .

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: Let's . . .

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 the ideas with 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?



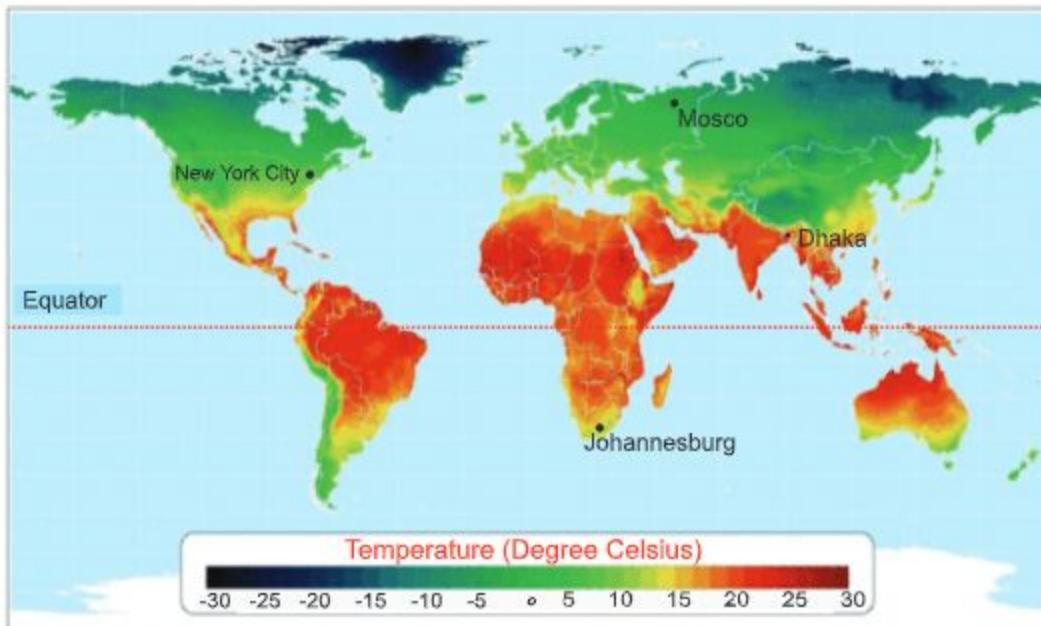
Activity : Distribution of Temperature on the Earth

What to Do : Let's . . .

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 the ideas with classmates.



Summary

Climate

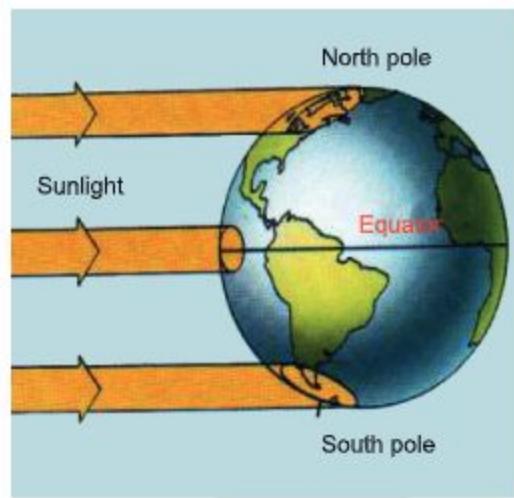
Weather may change every day but there is a usual weather pattern. We call this usual weather pattern as our climate. **Climate** is the average weather condition on an area for many years.

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.

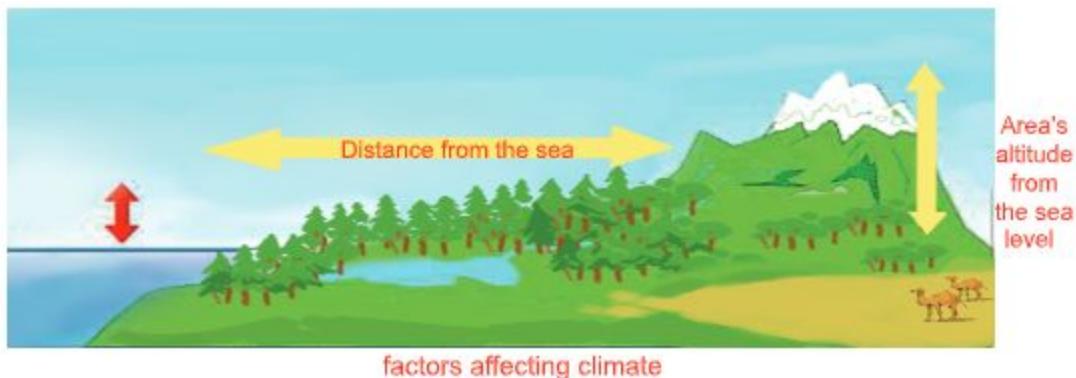
Yearly and Monthly Average Temperature at Dhaka and Moscow (Degree Celsius)

| 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 |

The climate of a particular place mainly depends on its latitude, height above sea level and distance from the sea. Latitude refers to a location's angular distance from the equator. Near the equator, the Sun's rays fall on the Earth vertically. So, the area of the earth's surface near the equator is hotter. As the earth's surface is round, places far from the equator are heated relatively less by the Sun's rays. As a result, all these places are relatively cool. The higher the value of latitude, the cooler the climate.

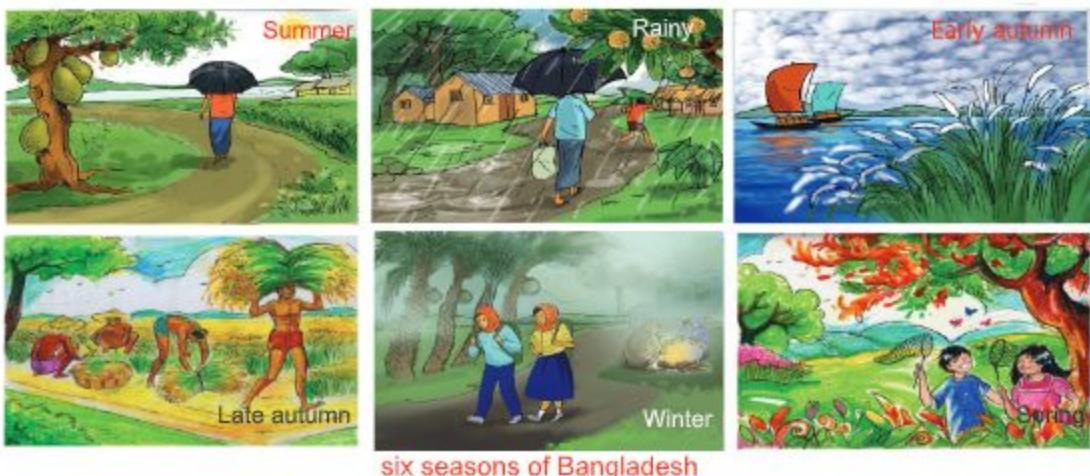


latitude and climate



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. Early Autumn consist of *Vadra* and *Ashwin*. White and fluffy clouds are seen in the sky in this season. *Kartik* and *Agrahao* 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.



The seasons in Bangladesh differ from those in other countries in the northern hemisphere. In some countries, there are only four seasons: summer from June to August, autumn from September to November, winter from December to February and spring from March to May.

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 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 |

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 the ideas with 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. Then you have to come forward to help others.



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: Let's . . .

- 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 | |

- 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.



keep a person calm!

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.

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.

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.



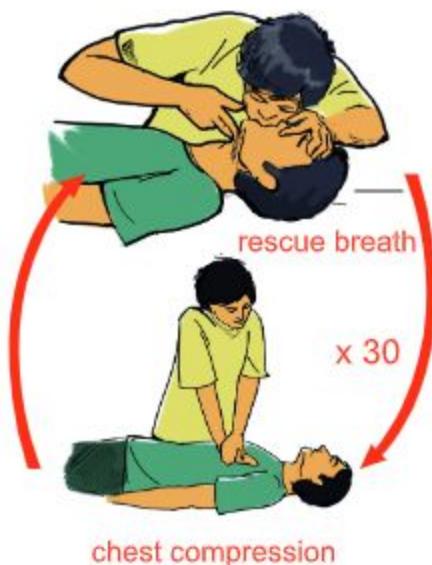
rescue of a drowning person



open airway by lifting the chin

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 arrival.



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

- 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.
- Call emergency services for help as soon as possible.
- 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:

- Avoid such a place where snakes may live in.
- Try to remember the color and shape of the snake.
- Call emergency services for help as soon as possible.

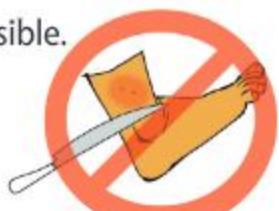
What to do if a snake bites.

- Keep the patient as steady as possible.
- The snake bitten part of the body should be kept below the chest position.
- A rope or cloth should be tied a little above the cut area in such a way that the affected person does not feel discomfort or pain.
- Take the patient to the nearest hospital as soon as possible.



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.



Try It !

◆ What should we do?

1. With the help of the teacher, let's practice with our classmates how to rescue and give first aid to a friend who has been injured in various accidents.
 - A friend injured in road accidents.
 - A friend injured in fire.
 - A drowning friend.
 - A friend who has been electrocuted.
 - A friend who has been 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 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?

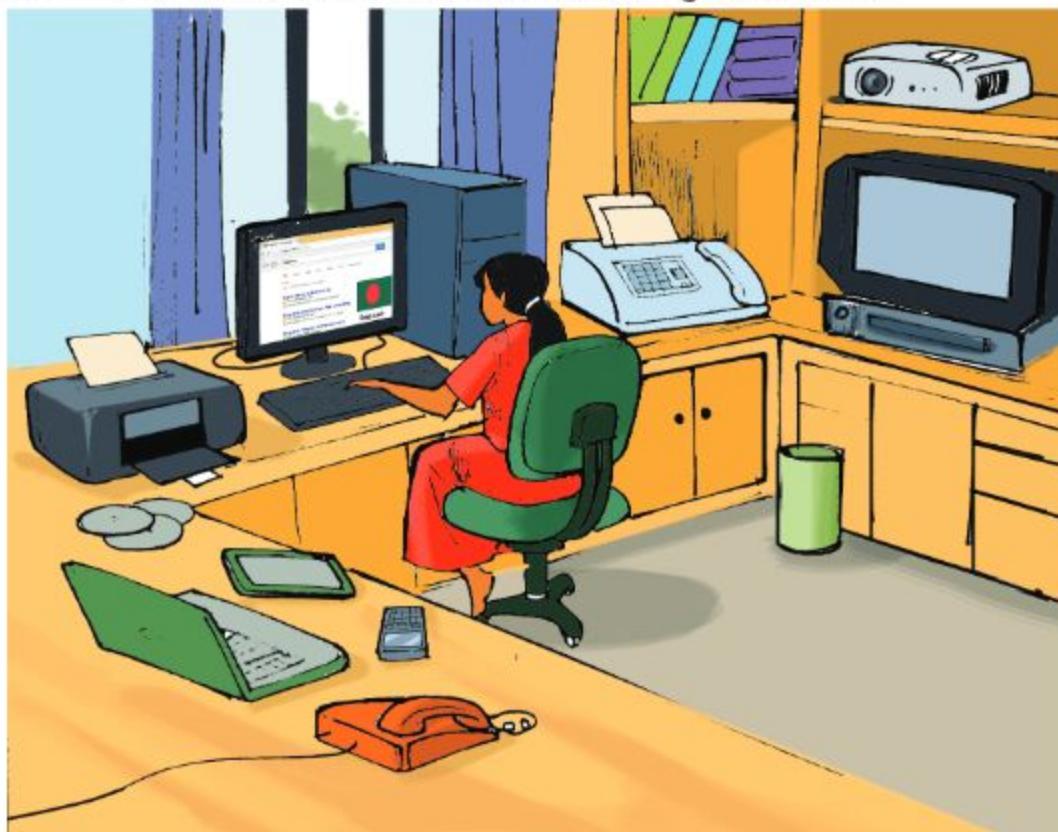
Information in Our Life

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

1. Improvement of ICT

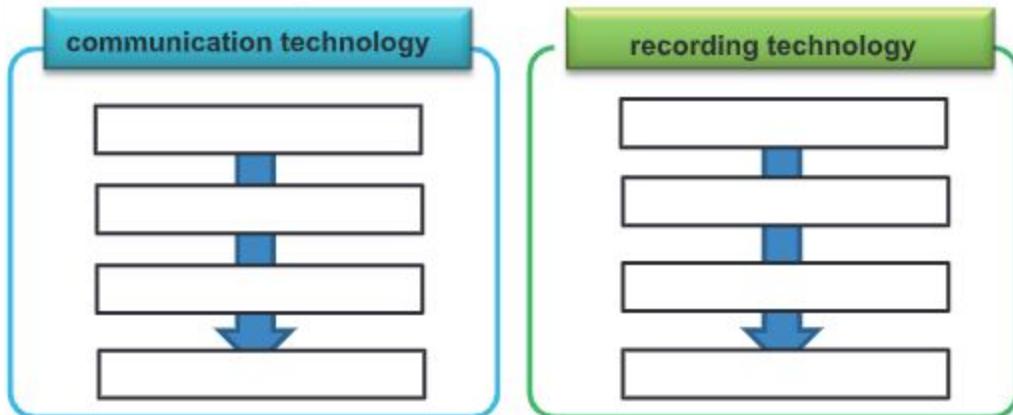
QUESTION : How has ICT improved?



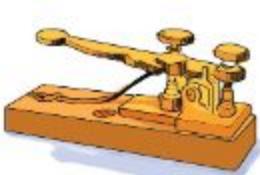
Activity: Development of ICT

What to Do: Let's . . .

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



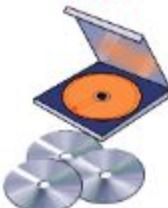
internet



wall painting



telephone



CD



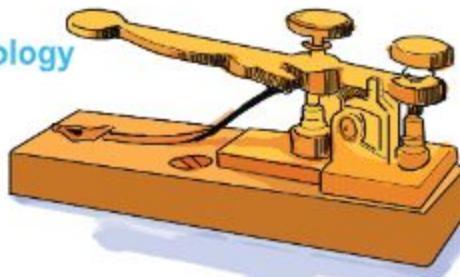
TV

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.



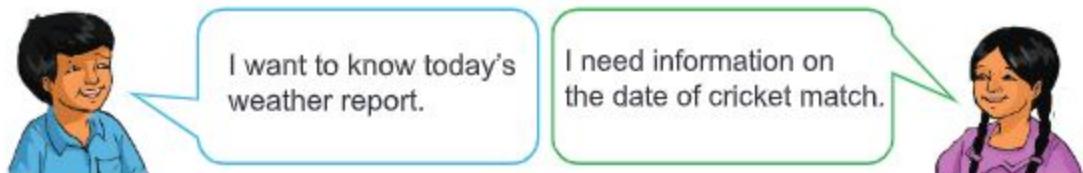
technology for recording information

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:** Let's . . .

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.

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. carrier 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. Short 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. Descriptive Questions.

- 1) Explain four steps for a wise use of information.
- 2) Explain how we can store information.

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

| | |
|--|--|
| communication technology recording technology source of information a way of collecting information | television observing camera 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: Let's . . .

- 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 | | |

- 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).
- if a person needs 10m² 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).
- share the ideas with classmates.

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.

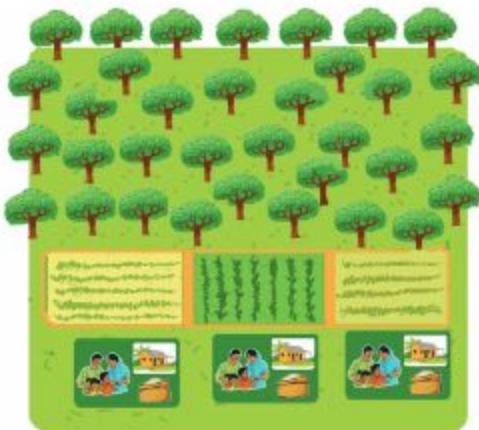
1. What is the relationship between growing population, and needs of food and space?
2. Share your idea with your classmate

What happens to the food and space in the table when population grows?



Summary

People need food and shelter 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 : Let's . . .

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 the ideas with 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 growing. One of the reasons is there are great advances in science and technology. Advances in science and technology has made it possible for people to produce enough food. Advanced medical technology help people 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 cause their 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 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 |
| (°C)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. | |

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|--|---|-------|
| 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 contains 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 |

Glossary

| | | |
|------------------------|---|-------|
| 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 reservoir 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, using less, or resulting in a smaller amount of waste. | 26 |
| renewable resource | A natural resource that can be replaced by nature | 50 |

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|-------------------|--|----|
| 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 |

Glossary

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|--------------------|--|----|
| 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 |

Academic Year 2025, Class Four—Science



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