

New Edition



My Science, Health and Physical Education



Class Five

MY

SCIENCE, HEALTH AND PHYSICAL EDUCATION

Grade 5



Government of Nepal
Ministry of Education
Curriculum Development Centre
Sanothimi, Bhaktapur

Publisher

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Preface

With the intention of making school level education more purposeful, behavioural and contextual, a process of continuous revision and reform is adopted by the Curriculum Development Centre (CDC). It is obvious that the curriculum is the core part of teaching-learning process, and the textbooks are major means of implementing school curricula at grassroot level. In accordance with the school curricula, the textbooks keep on changing with a view to addressing societal needs, demands of learners and modern technology in the field of teaching and learning, especially to foster knowledge, skills and positive attitudes in the students so that we can produce skilful, moral, obedient and globally competent citizens. To accomplish this purpose, an attempt is made to bring this book in the present form.

One of the most important characteristics of this book is that the contents of My Science, Health and Physical Education are presented and kept separately. Various pictures, activities are included to make this textbook more activity based and student centered. Similary, teaching instructions are also given to facilitate teachers in their teaching . This book (Nepali version) was originally written by Ms. Durga Regmi in 2052 BS. In accordance with the revised curriculum of primary level, the portion of Science was revised by Mr. Chitra Prasad Devkota, Mr. Ram Prasad Subedi, Mr. Dambar Dhwoj Angdambe, Ms. Achala Thapa, Mr. Nanda Kaji Maharjan, Shankar Paudel, Mr. Balkrishna Chapagai and Ms. Nanu Dawadi. However, in case of the revision of Health and Physical Education, Ms. Binti Shrestha, Shailesh Acharya, Mr. Bigyan Khanal, Mr. Balaram Nepali, and Ms. Suna Sharma were involved. Hence, the CDC would like to express its thanks to all of them.

Finally, a textbook is a vital tool of effective teaching learning process in the schools. However, both experienced teachers and inquisitive students can use a number of reference materials and various other resources available in the market to teach and learn a variety of subject matters respectively. Due to lack of different types of reference materials in all schools throughout the country, most of the teaching-learning activities highly depend on the textbooks. In this context, it is expected that the experienced teachers are capable enough to design additional activities as per the demands that usually emerge in the classroom. Moreover, an attempt is made to make this book child friendly by including several motivating teaching-learning activities. Despite our sincere efforts, there may be some mistakes and errors in terms of subject matter, language, presentation style and graphics. In this regard, we definitely expect the constructive suggestions from the teachers, students, parents, readers and other concerned stakeholders to improve the book in its future editions.

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About the English version

The Curriculum Development Centre (CDC), from the very beginning of its inception, has been involved in developing curricula and textbooks of school education. Moreover, it revises school curricula and textbooks at different time intervals as mandated by the Government of Nepal with a view of making school education more purposeful, practical and employment oriented. In the present era, creating a sense of national integrity and democratic culture on students is increasingly becoming a need of Nepalese society. Equally important is to developing linguistic and mathematical skills, and providing fundamental knowledge relating to the fields of Information Technology, Environment and Health.

In Nepal, English language as a medium of instruction is growing its popularity after Nepali. The public schools are gradually progressing in using English as a medium of instruction. Keeping this fact in view, the Executive Directors of CDC Mr. Laxmi Bahadur Khatri initiated all the school text books from Nepali into English mainly to meet the needs of learners, parents and teachers. This is one of the steps towards the goal.

We are hopeful that this text book in English version will contribute in meeting the needs of both public and private schools of the country. Besides, we look forward to reducing the dependency of private schools on text books written by foreign writers.

The subject expert involved in translating the textbook "Science, Health and Physical Education" was Raj Narayan Yadav. The CDC would like to express its gratitude to him for bringing the book in the present form. At the end, Mr. Yamuna Mahat deserves a lot of thanks for his painstaking efforts in editing the language of the textbook. Credit goes to Mr. Bharat Kumar Pradhan also as an over-all editor of this textbook.

A textbook is not all in all. It is only a means of executing the curriculum. An experienced and well trained teacher can use a variety of instructional resources for effective teaching-learning transaction in the classroom. Last but not the least; the CDC would be glad to express its hearty thanks to all experts who directly or indirectly made meaningful contributions to the translation of this book. The book could have some mistakes and errors despite the CDC's endeavours in making it child friendly and interesting. So, the CDC welcomes all the constructive suggestions for its further improvement in the forthcoming editions.

Ministry of Education
Curriculum Development Centre
Sanothimi, Bhaktapur

CONTENTS

Chapter	Topic	Page
1	Different Kinds of Animals	3
2	Cell	9
3	Life Cycle of a Butterfly	12
4	Monocotyledons and Dicotyledons	14
5	General Life Processes in Animals and Plants	19
6	Effects of Human Activities on Environment	23
7	Environment Conservation	29
8	Change of State of Matter	34
9	Sources of Energy	37
10	Weather	43
11	Cloud	48
12	Solar System	50
13	Earth	57
14	Information and Communication	62
15	Some Local Technologies	67

Health and Physical Education

Health Education

1	Personal Hygiene	75
2	Exercise, Rest and Sleep	78
3	The Need of Environmental Sanitation	80
4	Solid Wastes	83
5	Balanced diet	86
6	Cause of Malnutrition and its prevention	89
7	Communicable Diseases	92

8	HIV and AIDS	95
9	Let's save from accident	97
10	Safety and First Aid	99
11	Health Services and Community Health	101
12	Utilize Health Facility and Help others	104
13	Smoking	106
14	Alcohol and Drugs	108

Physical Education

1	Locomotor skills	113
2	Jumping	117
3	Throwing	120
4	Relays	123
5	Non-locomotor skills	125
6	Drill	127
7	Physical Training (P.T.)	130
8	Minor or Local games	135
9	Local Game	137
10	Creative Games	139
11	Ball games	141
12	Balance Work	142
13	Tumbling work	145

Science

Different Kinds of Animals

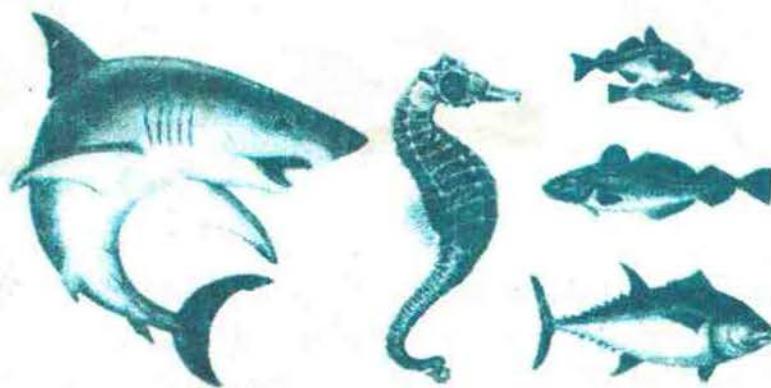
There are different kinds of animals around us. They are different in shape, size and body structure. There are two types of animals around us on the basis of the structure of their body. Some animals have backbone and some animals have no backbone. Fish, frog, snake, crocodile, pigeon, cock, cow, buffalo, dog, etc are the animals having backbones. Snail, earthworms, butterfly, grasshopper, spider, etc. are the animals having no backbone.

Animals with backbone (Vertebrate)

Many animals with backbone are found around us. Among these animals some of them can live in water only, and some of them can live both on land and in water. The structure of body of these animals is not uniform. The animals with backbones are divided into the following five groups.

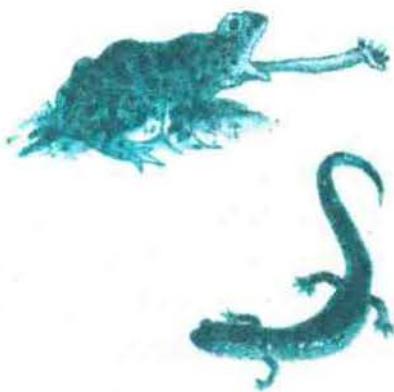
a. Fishes (Pisces)

All species of fishes are included in this class. They live in water. They are different in shape and size. Some of the fishes are large and some of small. They have streamlined bodies covered by scales. They swim in water with the help of fins. They have head, body and tail. They have gills to breathe. They lay eggs. Rahu, asala, baam, katla, sea horse, shark are some of the examples of this class.



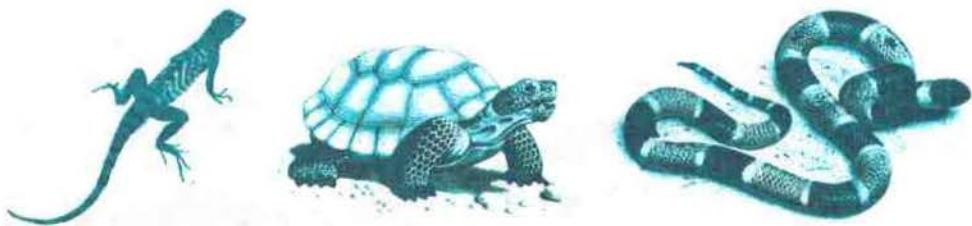
b. **Amphibia**

Amphibians can live in water as well as on land. Their bodies skin are smooth and moist. Their eyes are on the top of their body by which they can easily see around. They have head and trunk but not the neck. The hind limbs are longer than the forelimbs which enable them to jump. Toes are joined by the membrane so they have webbed feet that help to swim. Their tongue's tip is pasted which makes it easy to catch the insect. Frog lies in this group. The young frog is called tadpole. The frog's babies live only in the water in tadpole state and they breathe through gills. Frog breathe through skin when it lives in water and through lungs on land. They lay eggs in water. Frog, toad and salamanders lie in this class.



c. **Reptilia**

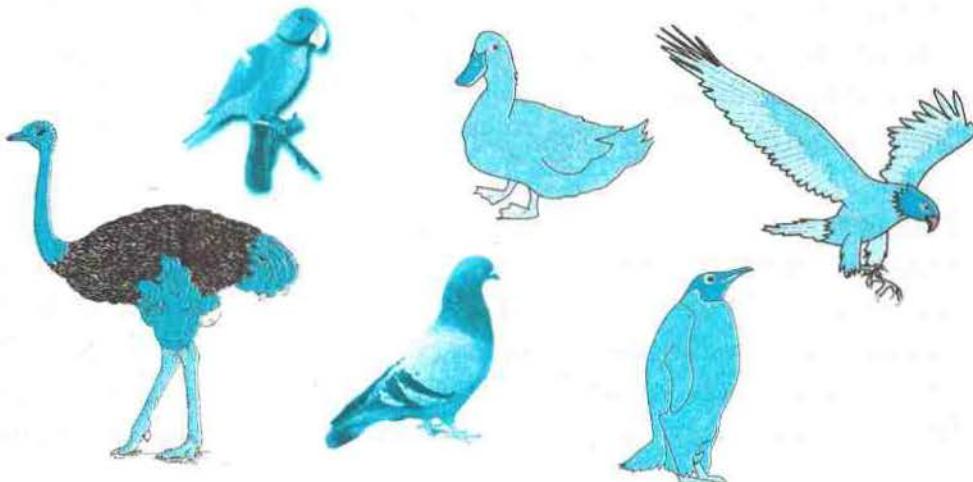
Most of the animals of this group creep on the land or wall. Some of the animals live in water too. They have head, neck, trunk and tail. Among these some have four limbs. The skin is dry and body of some reptiles is covered with hard scales. They respire through lungs. The female reptile lay eggs. Lizard, snake, tortoise, crocodile, etc. are the examples of this class.



d. **Aves**

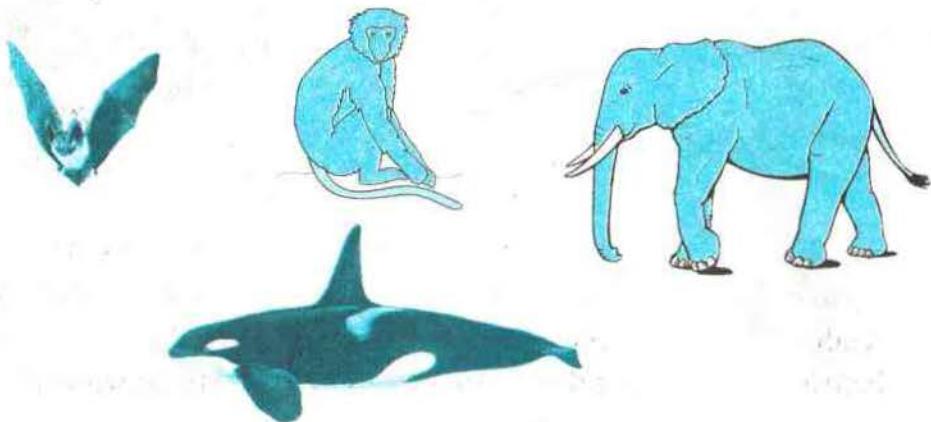
All birds are included in this class. Most of the birds can fly. The birds have a pair of wings. The wings as well as the body is covered with feathers. The feathers are of different colours. Feathers keep the body warm and wings help to fly. They have developed and hollow bone filled with air. The body

of birds is divided into the neck, trunk and tail. They have beak. They respire through lungs. Duck, sparrow, eagle, pigeon, dove, penguin, ostrich, peacock, crow, parrot, etc. are the examples of this group.



e. Mammalia

The body of mammalian is covered with hair. Their bodies consist of a head, a neck, a trunk and two pairs of legs. Some of the mammal's forelimbs are modified into hands. Most of them have a tail. They breathe through lungs. These animals have teeth and a pair of external ears (pinnae). They have highly developed brain. The females give birth to the young ones. All the females suckle their young ones. Forelimbs are modified into fins in the mammals like whale and dolphin so they can swim as fishes. The bat is a mammal which flies as a bird. Its forelimbs are modified into wings. Human beings also lies in mammalia. Rabbit, rat, cow, tiger, bear, whale, cat, dog, elephant, man, etc. are the examples of this group.



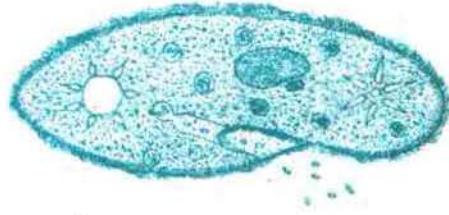
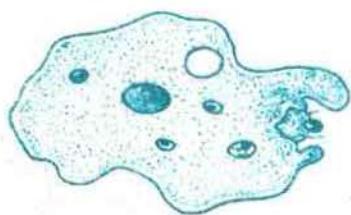
Animals without backbones(Invertebrates)

There are many invertebrates around our houses, school and neighbour. Most of the invertebrates have a shell to protect the body. Tiny animals that can not be seen by naked eyes as well as crab, scorpion, snail, earthworm, etc. are included in this group. We will discuss multi-cellular invertebrates in this lesson.

The invertebrates are divided into nine phyla. Among these phyla, some familiar and easily visible phyla are described below:

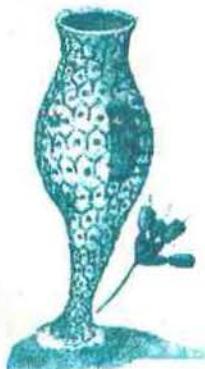
a) Protozoa

Organisms which cannot be seen by naked eyes. Very minute and whose body is made up of only one cell are included in this group. All the life processes conducted in their body are controlled by the same cell. They reproduce by binary fission. They are usually found in sea, inside human body or in damp places. Amoeba, paramecium, uglena lie under this group.

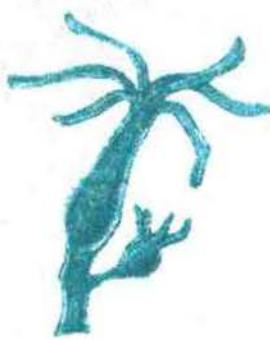


b) Porifera

The body of this group of animals have pores. They are called sponge. Their body is made up of many cells. They have no head, eyes and feet in their body. Spongilla lies under this group.



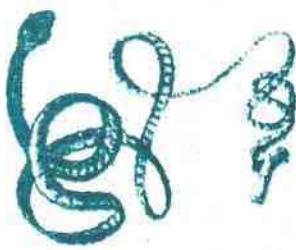
c) Coelenterata



These animals have hollow tube like body. They have a small mouth in their body but they have no anus. They catch their prey, usually small organisms by stinging with their tentacles. They do not have head or feet. The body part of this group of animals separate and form a new organism of the same kind. Hydra, corals etc. are the examples of this group.

d) **Platyhelminthes**

Animals in this group are flat in shape. The body of these is tapering like ribbon, while some are like leaves. They live in the intestine of cow, buffalo, liver of sheep, etc. and sucks the digested food or blood to survive. Therefore, they are called parasites. Tapeworm lives in intestine of human and pig whereas liverfluke lives in the bile duct of cows.



e) **Nemathehelminthes**

The animals included in this group have round and cylindrical body without segments. Their front (anterior) part and back (posterior) part are tapering at ends. They have a mouth at one end and the anus at the other end. Some of them survive by sucking the blood of other animals. The ascaris found in human intestine is a kind of parasite.



f) **Annelida**

The animals of this group have elongated, cylindrical and segmented bodies. Their bodies are covered with moist and soft skin. They have a distinct anterior part and posterior part in their body. Bodies are covered with soft and moist skin. They are found in water and in soil. Earthworm is found in the soil whereas Leech sucks the blood from outside of other animals and survives.



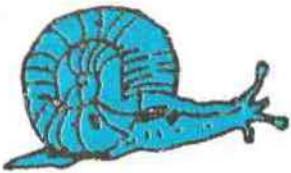
g) **Arthropoda**

Some of the animals of this group are found on land, swimming in water and flying in the air. The legs are jointed. The body is usually covered with hard exoskeleton. The body consists of three parts head, thorax and abdomen. Butterfly, housefly, spider, grasshopper, millipede, centipede, etc are the examples of arthropoda.



h) Mollusca

These animals have soft bodies. They include snail, octopus etc. Their bodies are enclosed in a protective covering called shell. Their bodies consist of a head, mouth and tentacles.



i) Echinodermata

The body of this group of animals is covered with hard exoskeleton. They are sea animals. Starfish, Sea Urchin etc. are the examples of this group of animals. Starfish have five fingers but do not have distinct body.



Exercise 1

Classify the following animals into vertebrate and invertebrate.

Fish, snake, pigeon, earthworm, frog, spongilla, bat, horse, butterfly, shark, snail, leech, bear, eagle, duck, whale, starfish.

Exercise 2

Write 2-2 name of the animals for the following categories.

Aquatic animals, Amphibian animals, Mammals, Aves.

Exercise 3

In our country's currency different kinds of animals are printed. Which animals are printed there, find out and write which category they belong to.

Exercise 4

Draw the picture of following animals and write 2-2 characteristics of each.

Fish, Bird, Earthworm, Snake, Butterfly, Frog, Cow, Hydrilla, Amoeba.

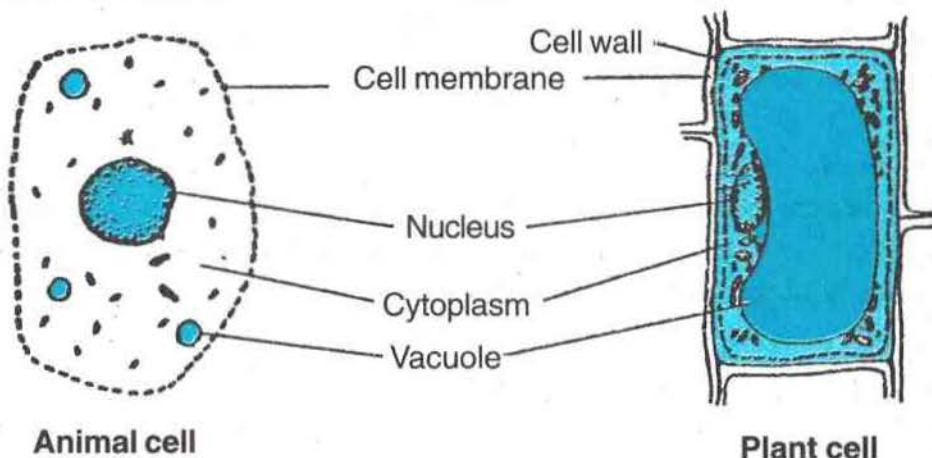
Teaching Instructions

- While starting your class, start from the observation of the environment around you.
- Focus on your teaching by observing the possible and available animals.

Cell

There are different kinds of animals and plants found around us. Some animals are small while some are big. Some of the plants and animals cannot be seen with our naked eyes. We need microscope to see them. The body of every living beings is made up of small units. These units are known as cells. All the life processes of the organisms are conducted inside their cells. Though the body shape of plants and animals are different, the structure of body cells are more or less the same.

Structure of Cell



The plant and animal cell consist of the following parts:

- i) Cell membrane/cell wall
- ii) Cytoplasm
- iii) Vacuole
- iv) Nucleus

i) Cell Membrane

Cell is surrounded by a thin membrane which is called the cell membrane. There is a cell wall outside the cell membrane in plant cell. Cell wall is not present in animal cell.

ii) Cytoplasm

A jelly-like substance is filled inside the cell membrane. This substance is called cytoplasm. It contains food and other various vital molecules. All the chemicals necessary to grow and survive of human being are produced in the cytoplasm.

In plant cell, there are long and small green pigmented bodies remain scattered in cytoplasm. These green pigmented bodies in cytoplasm are called chlorophyll. Plants prepare their food with the help of these chlorophyll in the presence of sunlight. There is absence of chlorophyll in animal cell.

iii) Vacuole

There are some large and empty space in plant cell. They are called vacuole. Vacuoles in animals' cells are smaller and temporary. Vacuole transports food and water in the cells.

iv) Nucleus

A spherical or oval shaped nucleus is found in each cell. It is found at the centre of cell in animal cell and near cell wall in plant cell. The nucleus controls all the vital activities of the cell.

Activity

Make the model of plant and animal cell using thread, bangle's pieces, wood pieces, balloon, paper etc.

Exercise 1

Put a (✓) for the correct and a cross (✗) for wrong statements.

- The size of all cells are not equal. ()
- Cell wall is found in animal cell. ()
- Vacuole of plant cell is large and permanent. ()
- Nucleus controls the activities of cell. ()

Exercise 2

Match the following.

Group 'A'

- a. Vacuole
- b. Chlorophyll
- c. Nucleus
- d. Cytoplasm
- e. Cell membrane

Group 'B'

- () Fluid like jelly
- () thinner layers
- () Green colour substance
- () empty space
- () Controls the various activities of cell
- () Cell wall

Exercise 3

Answer the following questions.

- a. What is called the smallest unit of the body of living things?
- b. What is cell wall? Where is it found?
- c. What is cytoplasm? What are there in it?
- d. Where is nucleus found? Why it is important?
- e. Write any two differences between plant cell and animal cell.

Exercise 4

Draw and label the parts of plant cell and animal cell.

Teaching Instructions

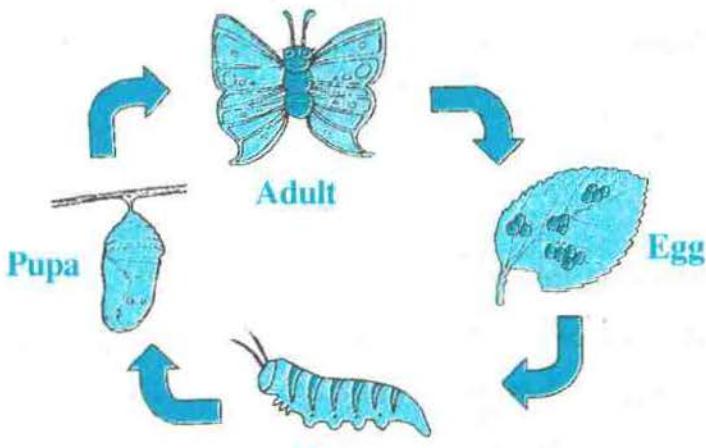
- Draw the cell of animal and plant and then show in the class.
- Try to show the model of plant cell from onion membrane with the help of torch light.
- If possible show the slide of animal and plant cell by microscope.

Life Cycle of a Butterfly

Most of the insects have four stages i.e. egg, larva, pupa, adult in their life cycle. The butterfly has also four stages in its life cycle as follows:

- i) Egg ii) Larva (caterpillar) iii) Pupa iv) Adult

Their brief descriptions are as follows:



i) Egg

The female butterfly lays eggs on the back side of leaves of plants. The eggs are very small and are different in colour. A sticky material paste the eggs in leaves.

ii) Larva

The colour of eggs gradually change into larva pupa after a few days. The larva of a butterfly is called a caterpillar. The body of a caterpillar is segmented. It has legs but not wings. Caterpillar starts to eat the leaves and grows. This is the voracious stage in the life cycle of butterfly.

iii) Pupa

When caterpillar stops to eat, it produces jelly like substance from its mouth and it wraps itself with this jelly. After sometimes it becomes immovable and inactive in the leaf. This immovable stage is called pupa and the wrapper or covering is called cocoon. Pupa is safe inside the cocoon.

iv) Adult

After some days cocoon breaks down and the young butterfly comes out. After few days, young female butterfly starts laying eggs. In this way, a butterfly completes four stages in its life cycle. It takes one week to complete its life cycle. The development of butterfly from its egg to adult stage is called life cycle.

Activity

Observe the plants of flowers or vegetables around you. You can see the leaves eaten by some insects. See the back side of that leaves. Some of the leaves might have small eggs of insects. Observe the eggs day by day for some days. Note down the day-by-day changes seen.

Exercise 1

Look at textbook or any other posture and draw the life cycle of a butterfly and label the different stages.

Exercise 2

Fill in the blanks with appropriate word.

- stage is the voracious stage of life cycle of a butterfly.
- The wrapper which covers the pupa is called
- There are stages in the life cycle of a butterfly.

Exercise 3

Answer the following questions.

- What is life cycle?
- Write the name of any four insects which have four stages in life cycle.
- Describe, in short, the life cycle of a butterfly.

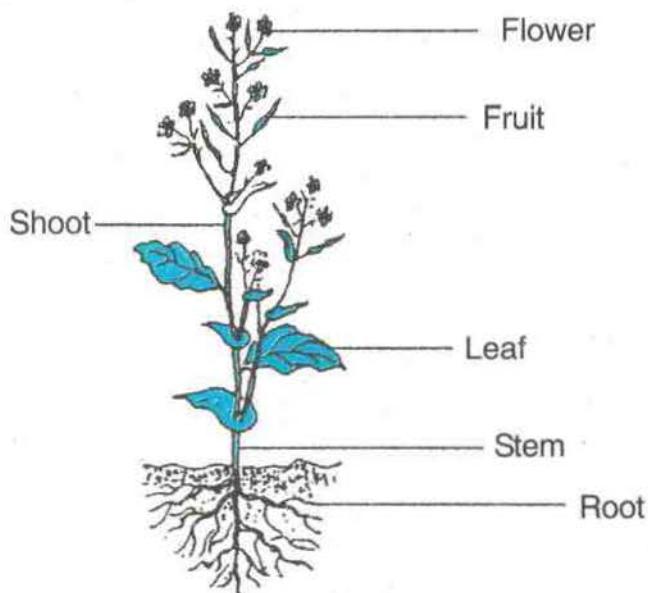
Teaching Instructions

- If possible, observe regularly the eggs of butterfly of leaf around the school and show the life cycle of butterfly.

Monocotyledons and Dicotyledons

Flowering Plants

See the plants around your house, school or neighbour. One part of the plant is under the ground or soil. The part of plants which is under the soil is called root and the part of a plant above the ground is called shoot. Leaf, flower, fruit etc. are there in the stem. Such type of plants are produced by seed.



Uproot a plant and observe its different parts carefully. Find the colour of roots, stem and leaves. Roots are white or gray in colour. Stem and leaves are green in colour. Flowers of flowering plants are in different colours like red, yellow, pink, purple etc.

Parts of the flowering plants and their functions

Root

The part of the plant which remains under the ground is root. It is white or brown in colour. The root of some plants goes vertically down or deep into the soil. This

root is called primary root. Such primary root are branched into thinner roots. Such type of main root is called Tap root. Gram plant, pea plant, mustard plant, etc. have such type of root.

In some plant there is not primary root and all the roots are similar. Such type of root is called fibrous root. The root of paddy, wheat, maize, etc. are the fibrous root.

Functions of the root

1. The root fixes the plant to the soil.
2. The root absorbs water and minerals, salts from soil.

Stem

The stem is the aerial part of the plant. The lower part(near the root) of the stem is thicker and it gradually becomes thinner towards the apex. The branches are produced in the stem. There are leaf, flower and fruits in the branch. Some plants have no branches.

Functions of Stem

1. The stem supports the plant to stand up.
2. The stem allows the movement of water and minerals absorbed by the root to different parts of the plant.
3. The stem carries prepared food to different parts of the plants.

Leaf

Different plants have different types of leaves. Plants have mainly two types of leaves. Dicotyledons like mango, peas, etc. leaves have one mid-rib. Through that mid-rib very small nerves are spread out around the leaves. Monocotyledons like wheat, maize, etc have the parallel ribs in leaves.

Functions of Leaf

- 1) Green leaves prepare food for plants.
- 2) They help to prepare food and inhale and exhale the gases. They take carbon dioxide during food preparation and take in oxygen and throw out carbon dioxide during respiration.
- 3) They throw away the excess water through stomata.

Flowers

Flowers are of different kinds. They are different in colours too. Flowers are the most attractive part of plant. Flowers produce fruit and seeds. New plants are produced from seeds. Observe the colors, shape, etc. clearly in the flower of plant near your houses or school.

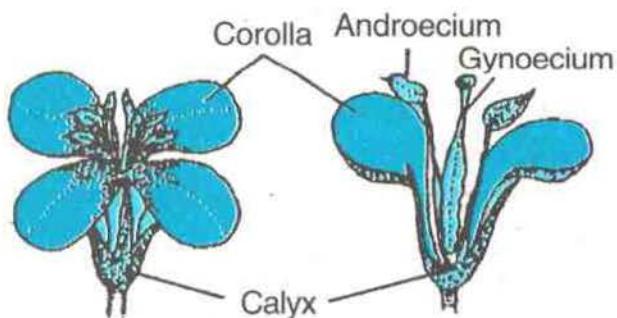
Parts of flower

Flower has four parts. They are

- i) Calyx ii) Corolla iii) Androecium iv) Gynoecium

i) Calyx

It is the outmost whorl of a flower. It looks like the structure of leaf. It is green in colour. It protects the flower in the bud stage.



ii) Corolla

The colourful parts inside the calyx is called corolla. The most attractive and colourful part is corolla. There are different shapes and colours of corolla in different flowers. It attracts human, insect, etc.

iii) Androecium

This part is inside the corolla. It is the male part of a flower. It has long stamen and in its tip there are sacs. The sacs are filled with powdery substances which are called pollen grains.

iv) Gynoecium

The gynoecium is the most innermost whorl of a flower. It is the female part of the flower. The base of the gynoecium is swollen (thick) and the upper part is just like a tube. The swollen part is ovary. Fruit and seeds are produced in this part.

Fruit

Fruits are produced from flowers. Fruit contains seeds. Fruits help the plant to protect their seeds and also to spread.

Seed

Seeds are inside fruit. Seeds get matured when fruits ripe. When seeds get favourable conditions, they germinate to produce new plants. There are different kinds of plants around us. Eg. grass, paddy, wheat, sugarcane, maize, vegetables, gram, peas, soyabean, pumpkin, etc. Plants are divided into two categories into Monocotyledons and Dicotyledons on the basis of structure of seed.

Monocotyledons

The plants like paddy, wheat, barley, maize, onion, etc are monocotyledons. There are only one cotyledon in the seed. We can not divide the seed into cotyledon. Monocotyledons have fibrous root. The leaves show parallel venation.

Dicotyledons

Gram, pea, soyabean, pumpkin, beans, etc. are dicotyledons. The seeds can be divided into cotyledons. There is a tap root in dicotyledons. Secondary roots develop from tap-root. The leaves of dicotyledons are flat and ribs are just like webs.

Activity

Classify the plants into flowering and non-flowering groups which you find around you.

Exercise 1

Fill in the blanks with appropriate word:

- a. Roots plants to the soil.
- b. Stem is the part which remains the ground.
- c. The outermost part of flowers is called
- d. is the male part of a flower.

Exercise 2

Match the following.

- | Group A | Group B |
|----------------|-------------------|
| a. female part | () Green |
| b. Stamen | () Colourful |
| c. Calyx | () Pollen grains |
| d. Corolla | () Gynoecium |
| | () Fibrous root |

Exercise 3

List the following plants into Monocotyledons and Dicotyledons.

Mango, Apple, Pumpkin, Wheat, Maize, Soyabean, Pea, Garlic, Orange, Paddy, Gram.

Exercise 4

Draw a picture each of monocotyledon and dicotyledon and label the different parts.

Exercise 5

Draw a flower and label its different parts.

Teaching Instructions

- While explaining about the parts of plants bring a real plant and show the different parts of the plant. Show them leaf, flower, fruit, stem, seed, etc. through the real plant as shown in the chapter.
- Remind them that plants also take in oxygen and give out carbon dioxide as animals during respiration and they take in carbon dioxide and give out oxygen during food preparation process.

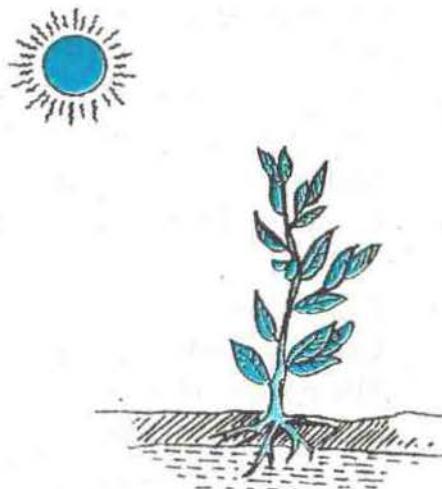
General Life Processes in Animals and Plants

Different processes are conducted in the body of living things to survive. Such processes are called life process. In this chapter, we will study the general life process of animals and plants.

1. Nutrition

All the living things need food and water to survive. Living things get energy from food. All the functions are running in the body by such energy. Green plants are able to prepare food themselves with the help of chlorophyll. The process of preparing food by green plants with the help of sunlight, carbondioxide and water is called photosynthesis.

Green plants can prepare food for themselves and are called autotrophs. Non-green plant and animals can not prepare food for themselves. These animals and plants depend on green plants directly or indirectly. Some plants like mushrooms, fungi, etc. are non-green and can not prepare food. Rabbit, goat and other animals use green plants and their parts as a food. Similarly, tiger, jackal, lion, etc. survive by eating animals. So, animals that depend on others for food are known as heterotrophs. Herbivores like goat, rabbit and carnivores like cat, tiger are heterotrops. Likewise, omnivores like human being and saprophytes like fungi, mushroom which cannot prepare their food are also included in heterotrops.



2. Respiration

All the living things need oxygen for respiration. They get oxygen from air. Living things inhale oxygen and exhale carbondioxide and water vapour.

Living things inhale oxygen from air during respiration. The oxygen reaches in all the cells of body. During respiration process, nutrition is broken down into carbondioxide and water and energy is released with oxygen. Excessive water and carbondioxide is released as a waste and again mix into atmosphere. Animals do not need carbondioxide but plants need carbondioxide during photosynthesis process therefore they reuse carbondioxide exhalation by living things. After photosynthesis oxygen again mixes into atmosphere. Hence the balance between oxygen and carbondioxide is maintained in the environment and life cycle of animals and plants continues.

3. Internal transport

To survive living things, the food inside the body has to be supplied from one part to another. This process is known as internal transportation. This process is needed mainly to supply the food, water, various gases and other necessary material in different parts of the body. In this process, carrying the unnecessary wastages to the excretory organs is also included. The blood does transportation in developed animals. In the plant also absorbed water and food reach from root to stem and leaves through internal transportation. The prepared food in green leaves is again reaches the root, branch, flower, fruit and other parts through the stem. In the sameway, transportation is conducted through protoplasm in microscopic organisms.

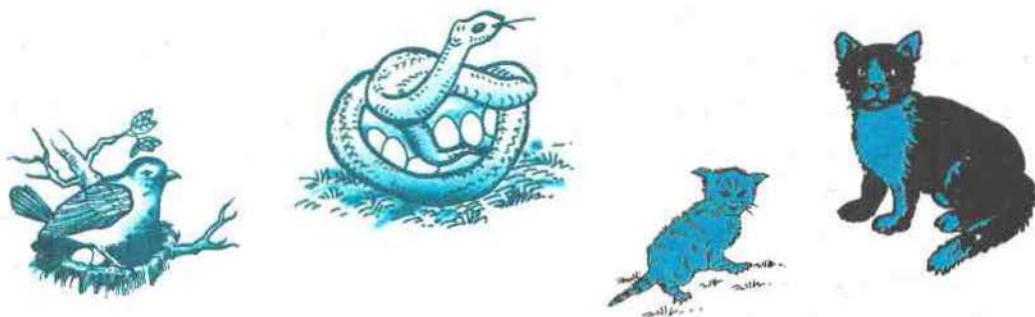
4. Excretion

Unwanted substances are produced inside the body during the life process. The process of releasing the waste substances from the body is called excretion. Animals throw faeces, urine, sweat, mucus, cough, carbon dioxide as unwanted substances. Plants do not excrete as animal. Throwing out of carbon dioxide, the water by leaves, gums, resins etc. are excretion in plants.

5. Reproduction

All the living things reproduce their own kind. The process of giving birth of own kind to continue the generation in living things is called reproduction.

Seed is produced from paddy plant and again paddy plant is produced by that seed. If we plant potato, only potato is grown. Similarly, animals also reproduce by different processes. Birds, snake, crocodile, frog, fish and insect lay eggs and they reproduce from these eggs. Human being, animals like dog, cow, rat, cat, horse, etc. reproduce by giving births of own kind.



Interrelationship between animals and plants

Animals and plants are inter dependent to survive. Food gives energy to living things. No animal and plant can survive long time without food. Animals and plants help each other for food.

Food in Animal and Plants

Animals are heterotrophs so they can not prepare food. Among the heterotrophs herbivores eat some parts or all parts of plants as their food. The different parts of plants store the food. This food is eaten by animals. Animals use sweet potato, potato, ginger, sugarcane, cabbage, cauliflower, apple, tomato, etc. as a food.

Among the heterotrophs, carnivores like tiger and leopard eat herbivores as a food. Omnivores eat animals and plants as a food. In this way, eating one animal by another animal the energy obtained by one animal by eating plants is transferred to the second animal. In this way animals and plants are interrelated.



Interrelation between Living Beings and Environment

As animals depend on plants for food similarly, plants also depend on environment to get essential elements for making food. There are tiny pores in the leaves which are called stomata. Carbon dioxide reaches inside the leaves through these tiny pores with water and minerals absorbed by plants and chlorophyll in the presence of sun light. Food (glucose) is prepared in leaves. In this process, oxygen gas is released through stomata and gets mixed in the air. Living beings take oxygen from air and during respiration, combustion takes place between food and oxygen. Carbon dioxide gas is produced in this process which is released out during respiration.

All the excretory substances released by living beings and dead bodies of animals and plants are decomposed by microbes and change into minerals. These decomposed materials are mixed in the soil with water by roots. Living beings take water and carbon dioxide from the environment, oxygen and other minerals from soil. They take the required gas and mineral and return the remaining back into the atmosphere. This helps to keep balance in nature. Hence, living beings depend directly or indirectly on environment. Living beings play a big role to keep balance in nature.

Activity

Take a plate with little water, keep grams, peas and bean seeds for two-three days. What differences are seen in seeds? Observe and note down.

Exercise 1

Fill in the blank with appropriate word.

- Animals get from food.
- Plants take gas in respiration.
- Plants take gas during photosynthesis.
- Animals and help to keep the balance of oxygen and carbon dioxide in the atmosphere.

Exercise 2

Correct the following statement if wrong.

- Air and water are enough to grow plants.
- Animals do not depend on plants to survive.
- All the plants prepare food themselves.
- Plants excrete water through roots.

Exercise 3

Write the short answer.

- How does plant get carbon dioxide gas to prepare food?
- Which materials are received from which sources by the plants to prepare food?
- What are any four life process in living beings?

Effects of Human Activities on Environment

The environment consists of both living (animals and plants) and non-living things (air, water, soil, etc). All human beings receive their essential food, water, shelter, air, etc. from environment. We all human beings are responsible to save or to destroy the environment. The animals, plant, air, water, etc. existing in environment are effected or polluted by human activities. The misbehaviour like unsafe defecation, throwing the garbages all around, leaving domestic animals near the sources of water, dust and smoke etc. also pollute the environment. Here, we will discuss about the bad effects of human activities on air, water land and forest.

Air

All the living things (animals and plants) get oxygen from air for respiration. Living things can not survive without oxygen. Therefore, oxygen is known as life gas. Human being pollutes such life gas by various ways.



Causes of air pollution

- Burning of firewood and kerosene, running the vehicles, smoke emission by burning the plastics.

- Various gases and dust particles produced by industries.
- Dust particles while constructing or maintaining building, road or running the vehicles.
- From smokes by setting fire in the forest or burning the tyres.
- Bad smell from rubbish, garbages, dead bodies thrown randomly.

Effects of polluted air

The dust particles, smoke mixed into air cause respiratory diseases like pneumonia, chronic bronchitis, cancer of the lungs, etc. and skin diseases. If air is polluted, it effects in climate change also. Polluted air also effects plants, animals, birds and human beings.



Water

Two-third of the earth's surface is covered by water. Water is found in the form of liquid, solid(snow) and gas(steam). The amount of water is more in the body of all living things. Animals and plants can not survive without water. People use water for drinking, for sanitation, farming for running industries and to generate hydroelectricity. How do you feel when you do not get water while thirsty? What would be the condition of plants of pot if you do not put water for some days. Have you noticed? Such valuable water is polluted by our cause.



Causes of water pollution

- Bathing and defecation in the source of river, rivulets, ponds, etc.
- Bathing animals in the sources of water and grazing near the water sources.
- By joining drainage/sewage directly to river without any proper management.
- Mixing of water containing chemicals by large industries into river.
- Dumping the garbages produced by house, hospital, industries near water resource.
- Throwing rubbish and dead body in water.
- The excessive use of chemical fertilizers and pesticides.
- Use of much potassium, chlorine, etc chemicals to purify water as needed.
- Washing vehicles near or in water sources.

Effects of polluted water

There are different kinds of germs in the polluted water. Communicable diseases like cholera, dysentery, typhoid, jaundice, etc. are caused by polluted water containing germs and water polluted by chemical causes cancer also. If water is polluted, it effects aquatic animals and plants. Polluted water pollutes the soil too.

Soil

One third of earth's surface is covered by land. The land where we live is made by soil. Different kinds of plants are grown and die on the land. We use those grown plants as our food. Have we ever thought that our land which is very important to us is being polluted day by day.

Causes of soil pollution

- Harmful chemicals produced by large industries.
- Excessive use of chemical fertilizer, insecticides and pesticides.
- Throwing plastic and other non-rotten materials in the land.
- Throwing the sewages in land without any proper management of drainage.

Effects of soil pollution

- Soil pollution effects plants badly
- Reduces the fertility of soil
- Effects the organisms living in soil.

Forest

There is important role of forest to conserve air and water of environment. The groups of wild animal and plants are different according to the structure of the land. We get fire wood, wood as well as herbs, fruits, fodders, etc. from forest. Forest provides shelter for wild animals and birds. It maintains the natural beauty therefore it helps to promote tourism industry.

You might have heard or listened the news that international as well as domestic tourist visit the different parts of the country to watch natural scene and animals like rhinoceros, elephants, tigers, bears etc. Such a beneficial forest is also being destroyed by human activities. Green forest, wealth of Nepal (*Hariyo ban Nepal ko dhan*) is becoming fake due to our activities.

Causes of deforestation

- Destructing the forest for shelter due to high population growth.
- Exporting of woods and wild lives by poachers.
- Grazing and leaving the cattle in the forest.
- Setting fire in the forest.

Effects of deforestation

- Flood, heavy rainfall, drought and soil erosion occur.
- Destruction of plants and wild animals.
- Sources of water become dry.
- Air and environment pollute due to setting fire.

Flood, landslides and soil erosion

Overflow of the water in river and rivulets is known as floods. The sliding down of soil by becoming heavy due to rain is landslide. You might know the destruction of wealth and life by floods and landslides.

Following the top layer of soil by floods, landslides and rain is soil erosion. The top layer of fertile soil is carried away so the fertility of soil decreases. Although floods, landslides and soil erosion are natural disaster, still human activities are mainly responsible for it to occur.



Causes of Flood, Landslide and soil erosion

- Cut down trees unwisely.
- Farming on slope land without making terrace.
- Encroaching the bank of river.

Activity 1

How are tap, pond, river, well etc. getting polluted in your surrounding? Observe and note down briefly the things you see there.

Activity 2

What activities are being done to pollute air by the people in your neighbour or village? Make a list.

Exercise 1

Tick (✓) the correct and cross (✗) the false statements.

- Polluted air is harmful for health. ()
- Air pollution is not done by human activities. ()
- Drainage should not be mixed in the river and lakes. ()
- Population growth is the main cause of deforestation. ()
- Farming on slope land does not cause soil erosion. ()

Exercise 2

Fill in the blanks with appropriate word.

- We should not use water purification more than necessity.
- and pollute the air produced by vehicle.
- Water containing chemical produced by factories mixes into river and rivulets cause water
- We should not on the slope without making terrace.

Exercise 3

Answer the following questions.

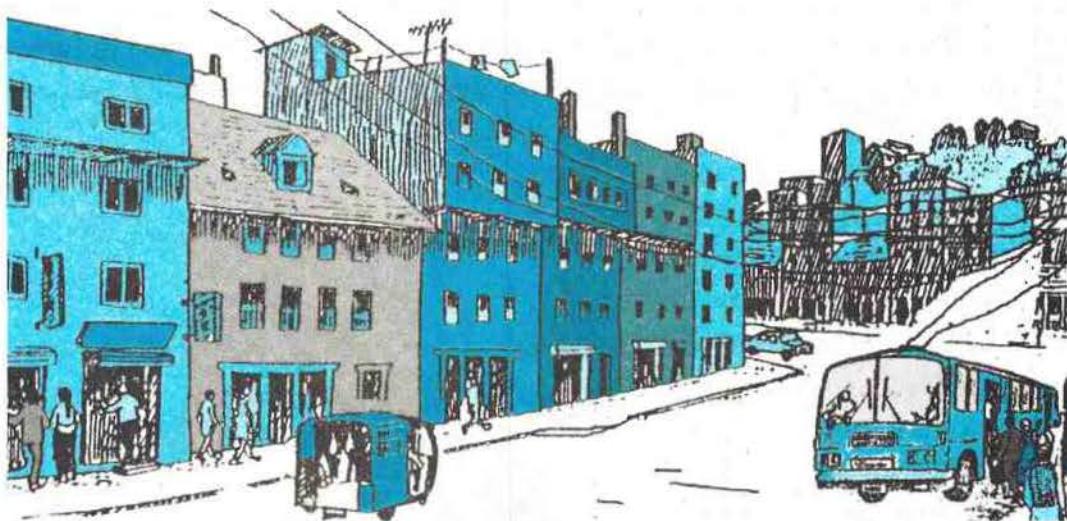
- Which activities of human being cause air pollution?
- What are the causes of pollution of water sources?
- What are the major causes of deforestation?
- What is soil erosion? Which activities of human being cause soil erosion?
- What are the effects of polluted water and polluted air?

Environment Conservation

How is our surrounding environment formed? What are the effects on animals, air, water in environment due to the activities of human beings? We have read about this in our previous lesson. Activities of human beings hamper not only the air, water, soil, wildlife and plants but it also hampers the useful germs and insects of soil, water, air. Human beings should pay attention to the following ways to keep balance and to create good environment.

a) Do not emit the smoke and dust

Improved smokeless cooking stove should be used to control smoke. Solar energy, biogas and electricity should be used instead of fire wood, kerosene, etc. Electrical vehicles should be given first priority. Timely checking of vehicle is also essential to control smoke. Plantation of trees on both sides of road should be done to control dust. Water and air pollution can be controlled by establishing industries far from settlement area. Similarly, to control germs and bad smell, wastage, dead body of animals should be buried in proper place. Defecation and urination should not be done everywhere.



b) Stop the hunting of wildlife

Wildlife survives by eating the things available in forest. One animal hunts another animal too. Tiger survives by eating jackal, deer, etc. Eagle survives by eating birds. Man hunts wildlives for personal benefits. Such activities degrades the wildlife and balance of environment is affected. Decreasing of tiger causes increasing the number of deer. Decreasing of birds causes decreasing number of eagle due to the shortage of foods. Therefore, man should not hunt wildlife.

c) Stop to set the fire in the forest

Forest is the habitat and source of food of wildlife. Deforestation causes decreasing in their number. Man gets fodder, firewood, herbs, etc. from forest. Therefore, it is difficult to survive human beings without getting forest product if deforestation occurs. Valuable wildlife and plants, vegetables are destroyed by setting fire knowingly and unknowingly in the forest. Therefore, we should not set fire in jungle. In case of fire, we should extinguish it jointly.

d) Protecting the forest

Forest is essential natural resource for all living beings. Forest is destroyed due to excessive use. Therefore, plants should not be cut unwisely. Animals should not be allowed to graze freely in the forest. We can protect the forest in this way. Environment will not deteriorate if men are involved in forest protection. In this way, if we protect forest and do afforestation, we can conserve forest and protect environment.

e) Tree plantation and conservation

There are open field, barren field and land in our area. They seem dry and desert. In these areas, plantation should be done and cared. Such activities do not destroy environment. Human beings, animals, birds get benefits if there are plants



in the forest. Plant roots tightly hold the soil and protect us from flood and landslide. Roots help to store the water and sources of water do not get dry.

f) Conservation of sources of water

People should not destroy the well, tap, pond etc. These should be kept clean. These should be brought to previous stage if filled by landslide, soil, etc. These sources of water help animal, bird, plant, vegetation and other living things to survive. Drainage pipes should not be joined directly in river and rivulets so that we can protect the sources of water being polluted. Drainage, waste water produced by industries, other wastage should be managed far from water sources. Defecation should not be done around water sources to protect water from pollution.

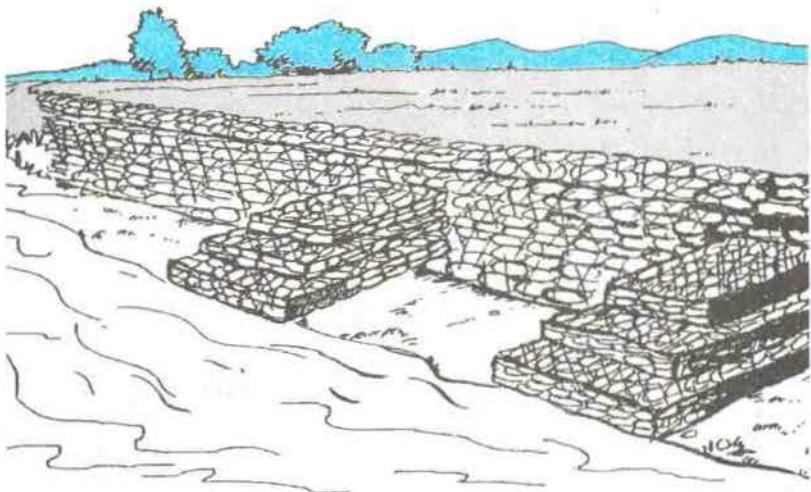
g) Farming in proper way

To protect the environment from landslide, soil erosion; terrace farming should be done. Terrace farming stops the flow of fertile soil. It protects the fertility of soil. It also reduces the possibility of landslide.

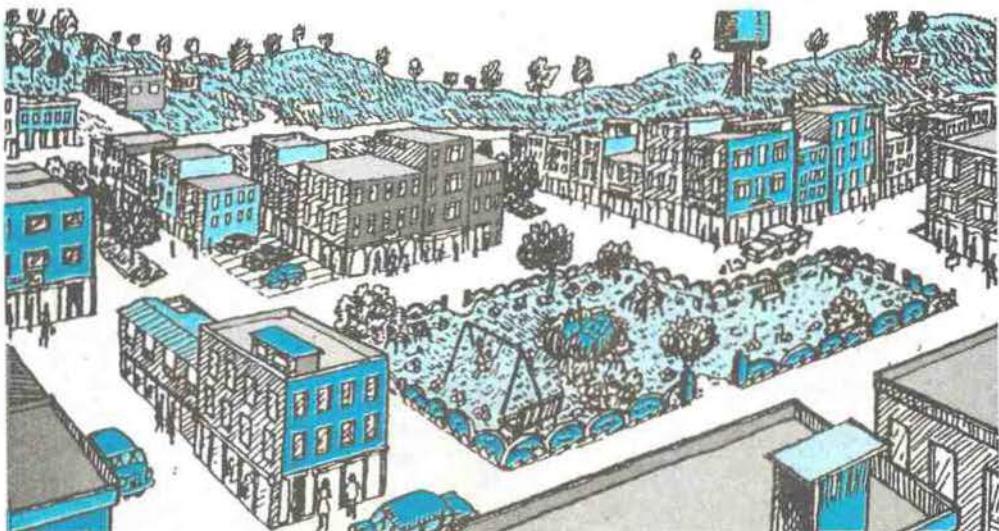


h) Constructing embankment

Letting the flow of river randomly transports the soil and landslide occurs. Therefore, dam or embankment should be constructed. Tree plantation should be done on both sides of river.



i) Developing planned urbanization



There are many houses, buildings, means of transportation in city as there are many people but There are less trees and plants in urban areas. Therefore, environment is unhealthy in cities. People construct building unsystematically so settlement is not healthy. Such settlement is unplanned urbanization. Environment is more polluted in unplanned urbanization. There should be open place between houses or buildings. Plantation should be done in different places. There should be good facilities of drinking water, latrine, drainage, market areas, hospitals, school and transportation in urban areas.

i) Proper management of garbage

It is very important to manage garbage properly to conserve environment. The polluted gas and water should be mixed into river, soil and air only after purification. Environment can be protected by appropriate management of bio-degradable and non-biodegradable wastage.

Exercise 1

Tick (✓) the true statement and cross (✗) the false statement:

- Tree plantation should be done to reduce the pollution caused by dust and smoke. ()
- The river and rivulet should be allowed to flow without embankment. ()
- Setting the fire in the forest destroys wildlives and plants. ()
- Farming should be done in slope area randomly. ()
- Unplanned urbanization increases environmental pollution. ()

Exercise 2

Answer the following questions:

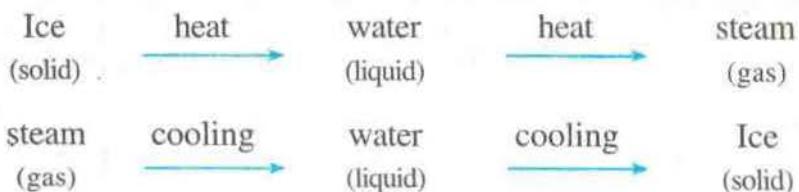
- What can be done not to make air polluted? Give two examples.
- How does tree plantation help in environment conservation? Describe.
- How does terrace farming in slope conserve soil? Describe.
- What should be done to protect human beings from flood, landslide and soil erosion?
- What is unplanned urbanization? How can be it managed?

Teaching Instructions

- Take the student in short distance tour near school and discuss with students about causes and methods done or to be done for controlling pollution.
- If possible, observe the site.

Change of State of Matter

There are three states of matter i.e., solid, liquid and gas. Ice is the solid state of water. Ice on heating changes into water. Water is the liquid state of ice. Water on further heating changes into steam. Steam is the gas state of water. These three states of matter changes from one state to another on heating or on cooling.

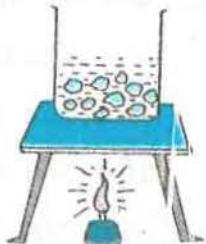


Hence, changing the one state of matter into another state is called change of state of matter.

Melting

Activity 1

Take some pieces of ice in the beaker or cooking pot. Heat it by a burner or a spirit lamp. What do you observe? Solid state of ice on heating gets heat energy and ice changes into water. The change of solid state of matter into liquid state is called melting.



Freezing

Activity 2

Take a candle. Lit it with a match. What did you see when the candle is burning? Now tilt the candle a little. The liquid wax falls down on the floor. What happens when it cools? Observe.



Wax gets heat energy by burning a candle and changes into liquid wax. Poured wax on the floor loses heat energy gradually and later on it freezes. The change of liquid on cooling into solid is called freezing.

Sublimation

Activity 3

Take some pieces of camphor in a basin and cover it with an inverted funnel. Keep the inverted test tube on the funnel. Cover the test tube with wet cotton. Heat the basin and observe. What change came in camphor?

Camphor changes into vapour directly on heating without changing into liquid. These vapours on cooling change back to solid. The process of converting solid directly into vapour by heating is called sublimation.



Evaporation

Activity 4

Take a beaker or kettle with water. Heat the beaker or kettle slowly. Observe it. What do you see after water starts boiling?

Water gets heat energy by heating kettle and water boils. After boiling the surface water changes into vapour and rises.

By heating change of liquid into gas is called evaporation.



Condensation

Activity 5

Repeat the activity 4. When water boils. Tilt the cold utensil (plate or spoon) put it close to the vapour coming out from kettle. When vapour becomes cool, what happens? Observe it.

Steam loses the heat energy and it changes into water. The change of gas on cooling into liquid is called condensation.



Exercise 1

Tick (✓) the correct statement and cross (✗) the wrong statement.

- a. The state of matter does not change on heating or cooling. ()
- b. By heating solid changes into liquid is called melting. ()
- c. By heating, camphor changes into liquid. ()
- d. Water on heating changes into vapour is evaporation. ()
- e. Liquid on cooling changes into solid is called freezing. ()

Exercise 2

Fill in the blanks.

- a. Liquid wax on cooling changes into
- b. On heating camphor changes in the form of
- c. On cooling water vapour loses
- d. On cooling liquid state of matter changes into solid is called
- e. On cooling water vapour changes into

Exercise 3

Answer the following questions in short.

- a. How does the state of matter change? Describe with example.
- b. How can water be changed into ice?
- c. What is evaporation?
- d. What is sublimation?
- e. Write any three examples of change of matters in daily life.

Exercise 4

Draw a figure and write the different state.

- a. Forming water by cooling water vapour.
- b. Converting camphor into vapour by heating.

Sources of Energy

Energy is needed to cook food, to boil water, milk and tea, to dry clothes, to move bus, truck, to keep body warm and to run industries. From where energy can be obtained? Energy can be obtained from sun, kerosene, fire wood, coal, diesel, petrol, natural gas, etc.

All the sources which provide energy are called sources of energy. Among the sources of energy, solar energy, forest, air, water, etc. can be used continuously. Such source of energy is called renewable energy sources.

Among the sources of energy, petrol, diesel, kerosene, natural gas, etc. are extracted from mines. It takes long period to form. The store of sources of energy will be empty after extracting. These energy can not be replenished when needed. Such sources of energy is called non-renewable energy sources.

Activity 1

Collect the sources of energy that are available inside and outside your house. And complete the table given below.

S.NO.	Source of Energy	Renewable	Non-Renewable
1.	kerosene		
2.			
3.			
4.			

Forms of Energy

Energy can be obtained in different forms. What are the energy used in our daily life? Heat energy, light energy, sound energy, etc. are some forms of energy.

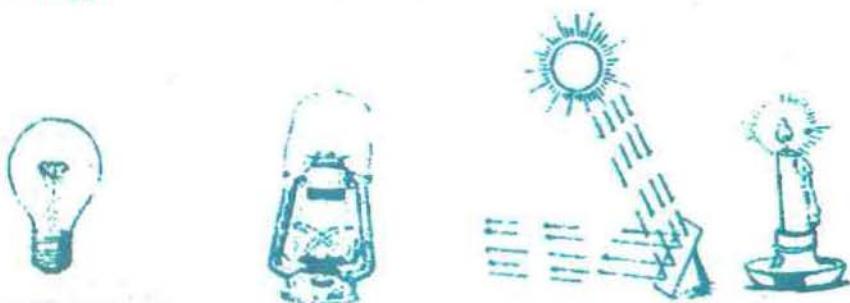
Heat energy

We get heat from sun and the burning fuel. We can get heat from electricity too.



Heat energy heats an object and if there is no heat, an object is cool. Heat energy brings objects in movement, for example, when water is boiled, it rises and sinks down. Heat brings changes in an object. For example, burning wood changes into charcoal and ash; and emits smoke, heat and light. Similarly, heat changes the state (solid, liquid and gas) of an object.

Light energy



We get light from sun, the burning object and electricity. Light energy helps us to see the objects. We can not see anything in the dark. Burning objects give light and heat together. For example, heat and light are coming together by sun. Burning lamp gives heat and light together.

Sound energy

The sound produced from vibrating or ringing object we feel and hear by ears is sound energy. We hear the sound when the vibration travels through air to our



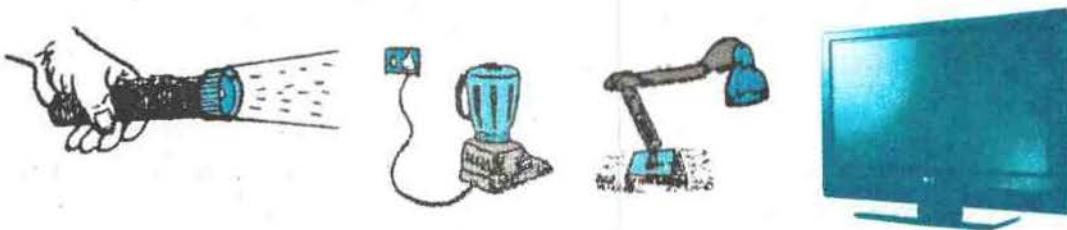
ears. There is movement from where sound is coming. They are vibrating when sound is produced. When a moving object is vibrating and effecting other object, sound is produced. Bell, Tabala, Sitar, etc are the sources of sound energy.

Activity 2

Take the Madal and keep it vertical. Keep the dust of chalk in black coated part. Hit with finger outside the black coated part of Madal. Observe. What effect is in dust of chalk? What are its causes?

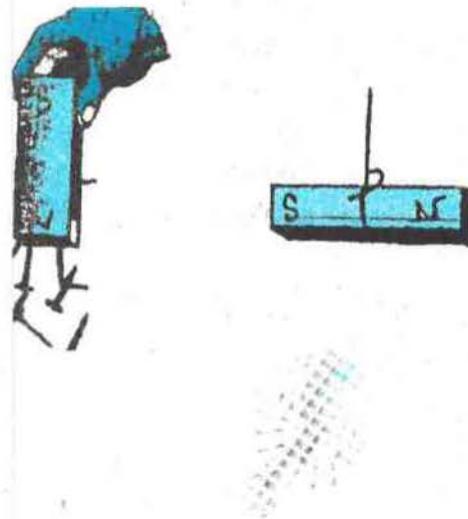
Electrical Energy

Batteries in torchlights are the source of electrical energy. Electrical energy is produced from batteries. The electricity used in our house is produced by moving turbines by the energy of running water. This electricity is called hydroelectricity. We get light and heat from electrical energy. It helps to operate various things like, radio, T.V., iron, fan, etc.



Magnetic energy

The energy present in magnet is known as magnetic energy. A magnet attracts iron or objects made up of iron. In industries, iron objects are lifted with the help of magnet. Magnetic energy is also used in telephone, electric bell, radio etc. When a magnet is hanged, it turns towards north and south due to magnetic energy. It is easy to identify the north-south direction by magnet.



Activity 3

Take a bar magnet. Collect different things like pin, clip, dust of wood, piece of broken glass, stone, piece of iron, steel spoon, etc. and take these things near magnet turn by turn. Observe and fill the given table.

S.NO.	Things	Magnet attracts/does not
1.	Pin	Magnet attracts it.
2.		

Utilization of Energy

You do different works like reading, writing, running, jumping etc from morning to evening. Similarly, other people work like playing game and carrying loads. In this way, you might have seen different people doing different works. We use animals to carry loads, plough the fields, etc. We and animals need energy to do any types of work. We get our food and energy from plants and animals. But plants get essential light and heat energy from the sun. We and animals get heat and light from sun.

Running water also has energy. Running water runs *ghatta*. Blowing wind also has energy like running water. Fan is operated by blowing wind. Light and heat energy are most important for us.

None of the work can be done without light. As light, we use heat energy in various works. Heat makes things warm. Wet clothes, grains are dried by sun light. Heat energy changes water into steam. This steam becomes cool and falls on the earth as rain. The heat needed for germination is obtained from sun. Heat helps to hatch the eggs. Heat is needed to make curd from milk.

Ghee, wax, ice-cream, etc. are melted by heat. By melting iron and silver by heat, different things are made.



Electricity is generated by running water. Electrical energy is needed to operate heater, fan, radio, T.V. etc.

Magnet used in T.V., receiver, loudspeaker, etc. helps to produce sound. Dynamo of cycle, electrical motors, etc. are operated by magnetic energy.

Sun as the main source of energy

Sun is the main source of energy on the earth. The earth receives heat and light energy from the sun. Plants prepare foods by the heat and light of the sun. Other living things get food from plants. All the living things get energy from food.

None of the living things can survive on the earth without the sun. The heat of the sun changes the earth's water into cloud and due to this rain fall takes place and river-rivulets flow. From these we get electrical energy. If there was no sun, all the water would freeze and change into ice.

Solar cooker and solar heater are being used now-a-days. Calculator, traffic light and vehicles are being operated by solar energy. In case of energy crisis, solar energy only can be used as an alternative resource.

Energy crisis and ways to conserve energy

The store of coal, petrol, diesel is limited on the earth. Human beings are using these resources carelessly and unwisely. The continuous use of these resources will empty the store in the future. This condition is known as energy crisis. The proper use and management of such energy is known as conservation of energy. Here are some ways to minimize energy and to conserve energy.

- Coal, petrol and diesel should be used in a limited quantity.
- Use alternative source of energy like wind energy and solar energy excessively.
- Develop the electrical vehicles.
- Do planting of trees (Afforestation) to get timber and firewood regularly.
- Do not use electricity and fire unnecessarily.
- Increase the use of biogas and other bio-based fuels.

Exercise 1

Tick (✓) for the true and cross (✗) for false statements:

- a. Coal is renewable source of energy. ()
- b. Heat and light can be obtained by the sun and burning objects. ()
- c. Heat and light can not be obtained by electrical energy. ()
- d. Magnet attracts objects made up of iron. ()
- e. Electrical energy is generated by running water. ()

Exercise 2

Fill in the blank by using appropriate word.

- a. All living things get from food.
- b. Plant prepares with heat and light energy obtained from sun.
- c. Sound is produced from
- d. Magnet makes it easy to separate and

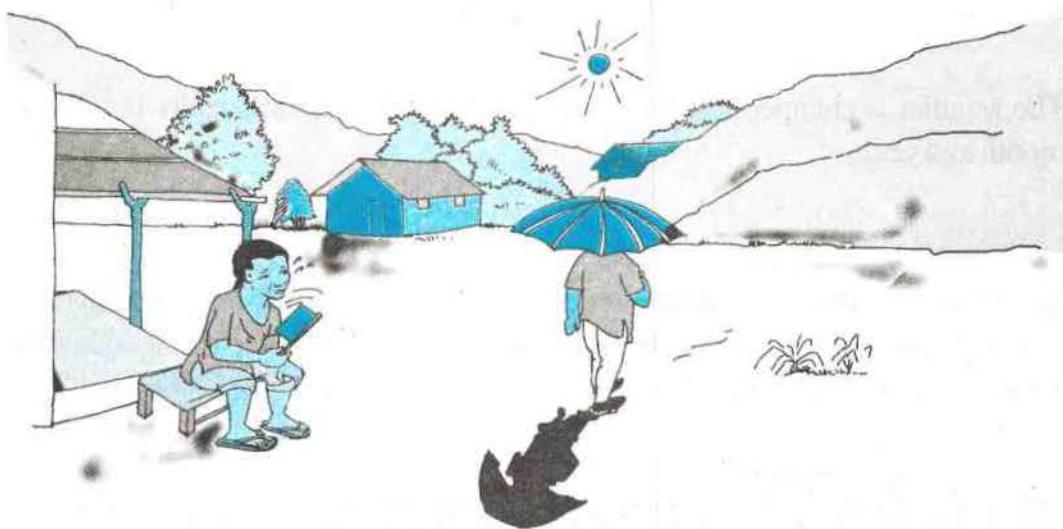
Exercise 3

Answer the following questions in brief:

- a. What are renewable sources of energy?
- b. Identify the renewable and non-renewable sources of energy given below:
 - i. Coal
 - ii. Petrol
 - iii. Wind
 - iv. Bio-gas
 - v. Sun
 - vi. Diesel
- c. What are the five forms of energy? Write.
- d. What is the utility of energy in daily life?
- e. 'Sun is the main source of energy.' how?
- f. Write any four methods of conserving energy.

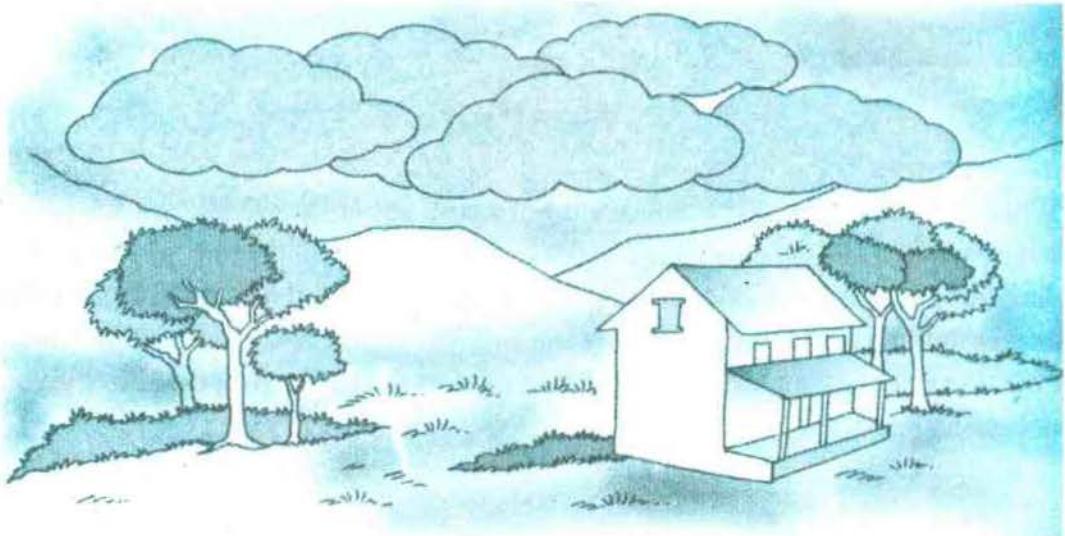
Weather

What is weather? What should we do to know about the weather of the place where we live and at school? Is the sky clear or cloudy? If the sky is cloudy, is it dark that causes rain or is it light that blocks the sun light? If is rainy, is it drizzling or downpouring? If the wind is blowing, what is the speed of wind and in which direction is it blowing? Observe today's environment and answer the above given questions.



You might have seen sunshine and the cloudy sky at the same time. Can you tell the reason behind it? Sometimes it rains with sunshine and sometimes it rains with storm. Sometimes cloud covers the sun and starts raining. So, the condition of sky, light, water, wind, temperature, etc. change frequently at our place. Such changes are called the changes in weather (weather change).

The changes in light, water, wind, temperature, humidity, etc. at certain place and time is known as weather. Climate is the combined form of temperature, humidity, atmospheric pressure, wind, water remaining at a place for a longer time and such conditions of atmosphere.



The weather is changed everyday. The weather changes drastically in a week, month and year.

Activity 1

In a week, how does the weather change while you are going to school, in tiffin time and returning from school in the evening? Observe and prepare the following weather record (every day's)

Condition of weather

Time \ Day	First	Second	Third	Fourth	Fifth	Sixth
While going to school						
In tiffin time						
While returning home from school						

Factors that cause changes in weather and climate

The temperature of atmosphere is changing frequently. The temperature of atmosphere is different in the morning, afternoon and in the evening. We feel hot while temperature increases and feel cold while it decreases. In this way, when the temperature of earth changes, the weather also changes.

Earth inclines in its axis in 66.5° angle and revolves the sun in oval orbit (way). While revolving the sun, the earth gets sometimes direct light and sometimes oblique. In this way, earth does not get sunlight regularly. So, the heat and light we get from the sun is sometimes high and sometimes low. The day is longer in the part of the earth that gets direct light from the sun. So the land gets heat and light for longer time and becomes hot season.

Similarly, the days are shorter in the part of the earth where the sunrays are most oblique and earth gets less light and heat for short time and the earth becomes cold, and there is winter season. In this way, due to the position of the sun and the earth weather and seasons (climate) change. The position of the earth as well as the following factors bring the change in weather and climate.

Monsoon

The wind carrying water-vapour or humid air from bay of Bengal is called monsoon. It brings rain in South-Asia. The wind causes a heavy rainfall in Nepal. Generally, monsoon begins from the second week of Jyestha but sometimes the arrival time of monsoon changes due to the change in climate condition.

Water Cycle

Water on the surface of the earth gets evaporated due to sunlight and heat. Water vapour rises and cools to form clouds. Cloud rains. In this way, water returns on the earth.

Humidity

The quantity of water-vapour present in air is called humidity. Water gets evaporated due to sunlight and mix in air. Air becomes damp due to evaporation. More damp air or air containing more water vapour is called humid air and dry and hot air or air containing less water-vapour is called dry air. When humid air blows, it rains.

Weather forecasting

It is necessary for us to know about the weather. Weather forecasting helps everyone to prepare and make a plan in time. Farmers should know more about it. We can make a plan in time with the help of weather forecasting.

What is weather forecasting? Have you listened(heard), weather forecasting at the end of news on radio? How is the weather forecasted? How is the present weather? Observe. Observing the past and present condition of weather and after some time telling about the weather is called weather forecasting. Present condition of weather should be observed for weather forecasting. In this way, if it observed the condition of present weather, we can forecast the weather. If we observe many places and for long time, it helps reliable weather forecasting. Some of the easy ways for weather forecasting are given below:

- If there is the scorching sun from the morning in the rainy season, there will be the possibility of rainfall in the day time.
- If it is cloudy since morning, it may not rain in the day.
- If it becomes very hot all of a sudden, it may rain.
- Normally, if there is continuous sunlight, there is the possibility of storm.
- If the sky is covered with black cloud suddenly it may rain.
- In our country, at the end of rainy season, if the cloud blows from west to east, after somedays it stops raining.

In our country, to measure the factors of weather change, meteorological departments are established with equipments in different places. We can know about the weather change with the help of the information gathered from the department. In this way weather is forecasted. Nowadays, weather satellites which revolve around the earth, takes pictures. From the pictures, observing the condition and speed of cloud, weather is forecasted. In the same way, weather can also be forecasted with the help of balloon and weather maps. These kinds of forecasting are more reliable.

Activity 2

Everyday, at 7:00a.m. (Almost one week), listen and see weather description on radio, television or newspapers. Find out how reliable news is that by observing weather and keep record.

Exercise 1

Fill in the gaps.

- Weather forecasting is reliable when it is done based on the taken by satellites.
- The changes of temperature of the earth causes change in
- Weather from place to place.
- In rainy season, if there is since morning, it may in the day time.
- Earth does not get sunlight all the time.

Exercise 2

Answer the followings.

- What is weather?
- What are the factors of weather change? List them.
- What is the cause of earth becoming hot when it gets direct sunlight?
- What do you mean by weather forecasting?
- What is difference between damp air and dry air?

Cloud

You might have seen cloud in the sky. Observe the cloud that block sun light and makes shadow and also observe cloud seen during rainfall. Do you get any difference? How is the cloud of different size and type formed? Think about it. The water of pond, lake, well, river, sea, etc. goes up in the form of steam due to sunlight. The steam goes up very high in atmosphere and gradually it starts becoming cold. When it becomes very cold, it changes in small particles of water. These small particles of water together forms cloud.



The cloud seen in the sky are different in colour, shape and expansion. In this unit, we will study the types and characteristics of cloud.

Types of cloud

1. Cirrus

Cirrus cloud remains at the top in the sky. It is white in colour, thin and curly. It is seen just like the bunch of cotton spreading in small pieces. It is very cold because it remains very high. It contains more amount of ice. The rain may fall with hails if it is seen more in the sky.



2. Cumulus

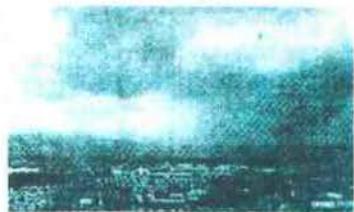


Cumulus cloud is white and thick. Its upper part is seen as cauliflower and white. In sunlight the upper part is seen bright and the lower is black. It makes shadow on the earth by blocking sunlight. If cumulus cloud is very dark, it rains. It contains huge amount of water. If it is very thick, lightening and thunder occur.

3. Stratus

Stratus cloud looks like ash in colour. Such type of cloud is spread in thin layers in the sky. It looks like fog when very thin stratus is near the ground.

When wind does not blow it can be seen in the early morning and evening time. Weather is calm, when it covers the sky. Thick stratus cloud helps to drizzle for long time.



4. **Nimbus**

Nimbus is dark brown and thick cloud. It is found at lower height than other cloud. Its shape is not fixed. The steam is found at the lower part of this cloud. If it covers sky, the day is very dark and rains heavily.



Activity

Observe the sky when it is covered with clouds. Recognize and identify different types of clouds as explained in the lesson.

Exercise 1

Tick (✓) the correct and cross (✗) the false statement.

- The cloud which is seen like fog is stratus.
- Cumulus cloud remains very high in the sky.
- Cloud is formed by consisting small particle of water vapour.
- The cloud found at low height is in brown colour.

Exercise 2

Fill in the blanks with suitable word:

- The cloud which contains more amount of ice is
- The evaporation of water vapour in atmosphere forms
- The lower part of stratus is
- Nimbus is coloured cloud.

Exercise 3

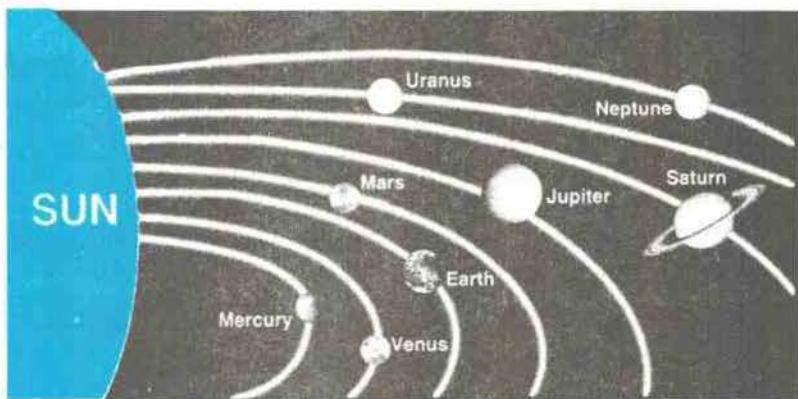
Write short answer.

- How is cloud formed? Write.
- Which cloud makes shadow on the earth? Describe.
- Give the introduction of lightning and thundering cloud.

Solar System

Sun and Solar System

The Sun is the nearest star to us. This is the burning ball of hot gas. The sun provides heat and light to all direction. We, too get heat and light from it. What would happen if there was no sun? Just think! Human beings, animals and plants get heat and light from the sun. The sun keeps the earth temperature constant and helps in water cycle. Sun is the major source of energy. Because of this no living beings could have survived in the absence of sun.



Solar System consists of the Sun and planet, satellite, comet and asteroid that revolve round the sun. The Sun is the main member of solar system. All the members of solar system revolve round the sun keeping it at the centre.

Planet and Star

The Sun has its own light. So, it is called star. Large round object in space that moves around the sun is called planet. The Earth is also a planet. The planets do not have their own light, however, they look shiny in the sky, why? Can you say? The planets reflect the light of the sun and look shiny. Objects that move around the planets are called satellites. The moon is a satellite of the earth. In our solar system there are altogether light planets including the earth. These planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

All the planets revolve round the Sun in an oval path. An oval path followed by a planet as it moves around the sun is called orbit. Every planet has its own orbit. The nearest planet from the sun is Mercury and the farthest is Neptune. Likewise, Mercury is the smallest and Jupiter is the largest planet. As the planets revolves round the sun, their position continuously changes. The earth is in the third position from the sun. The existence of life is possible on the earth because it has suitable temperature, water and oxygen essential for animals and plants.

Look at sky in the dark night. You can see innumerable heavenly bodies there. Some bodies twinkle and some shine continuously. The innumerable twinkling bodies are called stars. At a glance the stars seem like small dots of light. Because of far distances the stars look small. In reality, stars are burning and shining hot balls of gas. So they are luminous like the sun. Sun is also one of the stars that are seen in the sky. In comparison to other stars seen from the Earth, the sun is very near to the Earth and looks very bigger and bright. Some stars are thousands times bigger than the Sun. In comparison to the Sun and the stars, the planets are very small heavenly bodies.

Activity 1

On observing from the Earth the Venus is seen sometimes in western sky in the evening and sometimes appears to eastern sky in the morning. Observe and recognize. Also, help your friends to recognize it.

Activity 2

Take help from teacher or text-book and prepare a colourful chart of solar system. Write down the names of each planet.

Activity 3

Try to distinguish between stars and planets by observing the heavenly bodies in the clear sky during night. What are the differences between them? Fill in the table below and show to the teacher.

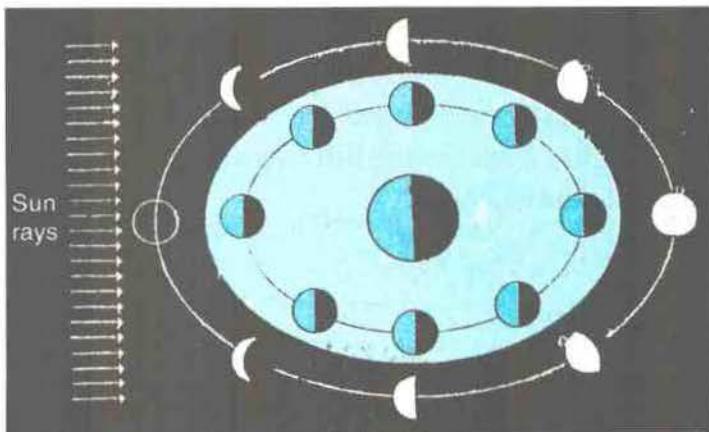
S.No.	Base of observation	Planet	Star
1.	Own light	No	Yes
2.			
3.			

Phases of the Moon

You might have seen the different shapes of the moon everyday. Every night during the time of moonlight period, different shapes of the moon can be observed. Why? On which day or condition can we observe the full moon?

The moon does not have its own light. It reflects the light of the sun and seems bright. The moon is the only satellite of earth. It revolves round the earth. While revolving round the earth the moon comes in between the sun and the earth at a time. At that time the dark part of the moon faces the earth and we cannot see the moon. This condition of the moon is called the new moon. Again in process of revolving round the earth, the earth comes in between the sun and the moon. At this time the bright part of the moon can be visible from the earth. Such condition of the moon is called the full moon.

Observe the moon everyday for a month, to know how it changes its shape. The lighted part of the moon increases gradually from the day of new moon and full size of moon is seen on full moon day. This period is called bright half. Likewise, from the full moon day the bright part of moon decreases gradually and the dark part of the moon faces the earth on a new moon day (or moon disappears). This period is called dark half. Such changing of the shape of moon daily is known as the phases of the moon.



It is easy to make monthly calendar due to phases of the moon. The duration between one new moon to another new moon or between one full moon to the other full moon is about a month. It is called synodic month.

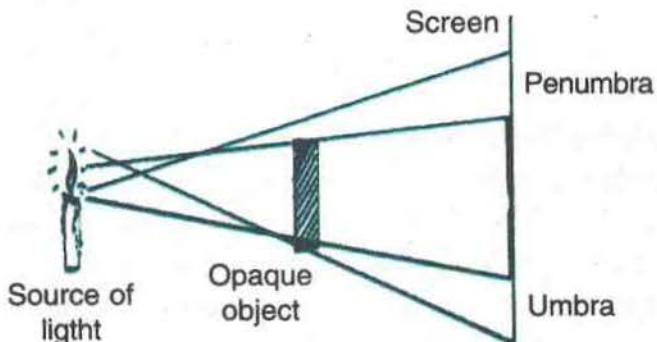
Eclipse

The earth revolves round the sun in its own orbit. In the same manner the moon also revolves round the earth. In the course of movement, sometimes the moon comes in between the sun and the earth and sometimes the earth comes in between the sun and the moon. When all the three heavenly bodies sun, moon and earth lie in a straight line, eclipse takes place.

During eclipse, either the earth or the moon lies in the shadow of one another. Therefore, it is necessary for us first to understand about shadow.

Umbra and Penumbra

When light falls on an opaque object, a shadow is formed behind it. Shadow is of two types. A dark shadow which forms behind the object is called umbra. A light shadow is formed on the outside of the umbra. This shadow is called penumbra.



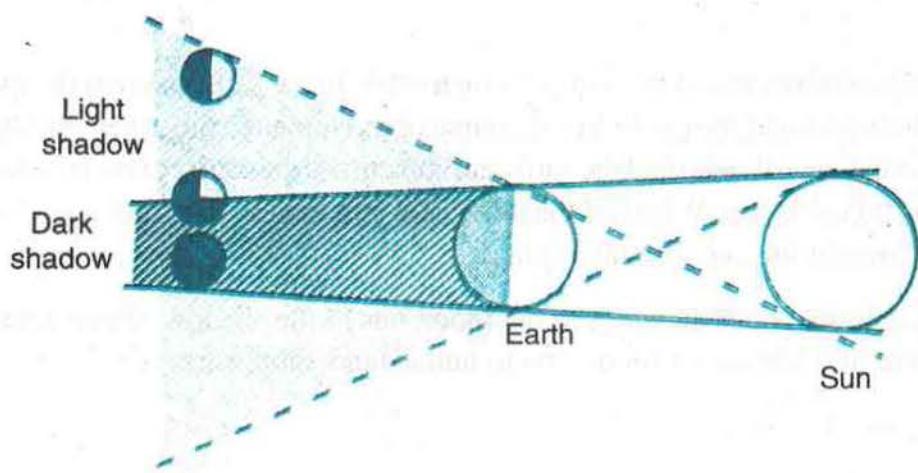
Activity 4

Take an opaque object like book, exercise book, wood etc. and place it in front of a lamp so that its shadow forms and falls on wall. Identify umbra and penumbra on the wall.

Lunar eclipse

The earth moves around the sun and the moon moves around the earth. While moving around sometimes the earth comes in between the sun and the moon and the sun, earth and the moon happen to lie in a straight line. In such condition, the earth blocks the sunlight and forms umbra and penumbra shadow. If the moon

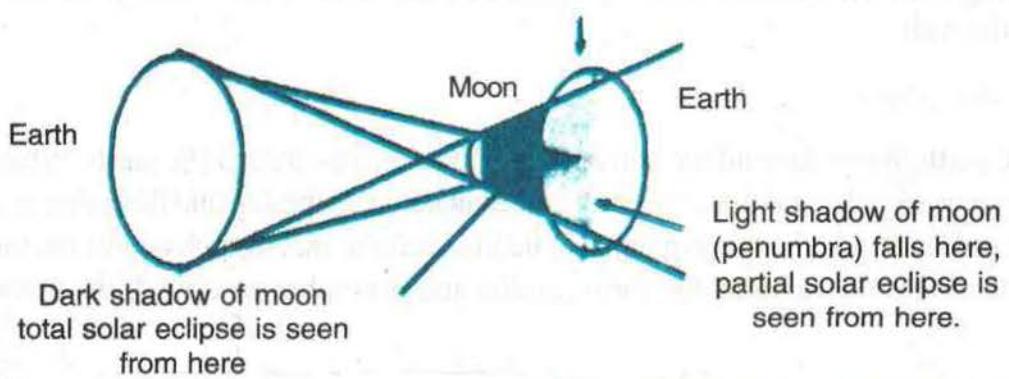
lies under the umbra of earth, the moon is completely covered by the shadow. Such condition is called total lunar eclipse. Similarly, if the moon lies under penumbra of the earth, only a part of moon is covered by the shadow. Such condition is called partial lunar eclipse.



Solar eclipse

During the movement of earth and the moon in their own orbits, the moon comes in between the sun and the earth and the moon, sun and the earth lie in a straight line. In this condition, the moon blocks the sunlight and forms two types of shadow umbra and penumbra. If sun is observed from the umbral part of the earth, it is seen completely covered with shadow. Such condition is called total solar eclipse. Similarly, if the sun is observed from the penumbral part of the earth, it is seen partially covered with shadow. Such condition is called partial solar eclipse.

Shadow of moon does not face in this part, eclipse is not seen from here



Activity 5

Observe the shape or bright part of the moon everyday from one new-moon to another new-moon. Write your feelings.

Exercise 1

Tick (✓) the correct statement and cross (✗) the false statement.

- a. The moon is a satellite of the earth. []
- b. Planets have their own light. []
- c. The smallest planet of the solar system is Venus. []
- d. There is the settlement of living things on the earth. []
- e. The process of increasing and decreasing the bright part of the moon is called phases of the moon. []

Exercise 2

Match the following:

Group 'A'

- (a) Planet
 - (b) Jupiter
 - (c) New moon
 - (d) Satellite
-
- () Dark night
 - () The Moon
 - () Star
 - () The largest planet
 - () The earth
 - () Full moon night

Group 'B'

Exercise 3

Fill in the blanks.

- a. There are planets in our Solar System.
- b. The heavenly bodies that revolve around the sun are called
- c. The earth takes days to revolve around the sun.
- d. parts of the moon faces the earth on a new moon.
- e. Stars have their light.

Exercise 4

Answer the following question in brief.

- What is solar system?
- How many planets are there in our solar system? Write their name according to their place.
- What is phases of moon?
- How are umbra and penumbra formed? Show with figure.
- How is lunar eclipse caused? Explain with figure.
- What is the difference between star and planet? Write any two differences.

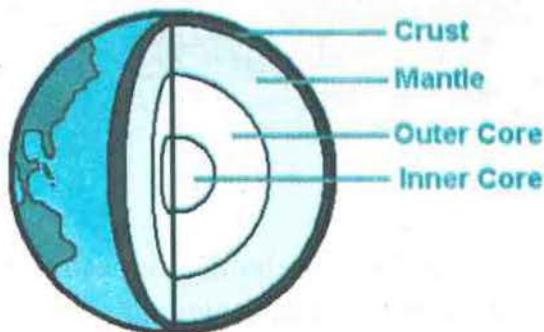
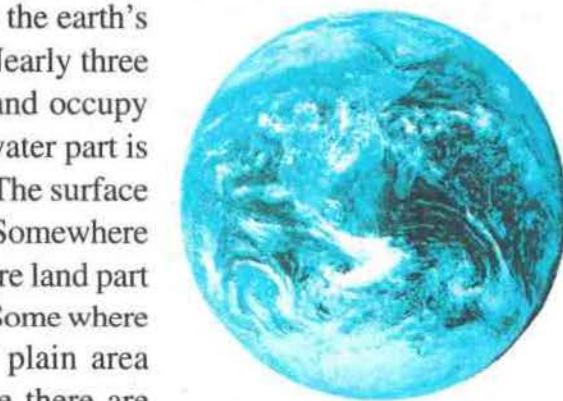
Exercise 5

Draw a neat and clean diagram of solar system and label it.

Earth

When we see globe we can find that the earth's surface consists of land and water. Nearly three fourth of water and one fourth of land occupy the earth's surface. In this way, the water part is more than the land part in the earth. The surface of land is not uniform in all the parts. Somewhere there is plain land whereas somewhere land part is raised to form hills and mountains. Some where there are valleys which consist of plain area surrounded by hills and somewhere there are desert. Were these things in the earth's surface from the ancient time? Think about it. Water surface is also not uniform as the land. Pond, lake, river, sea, etc. are the water parts.

Though the earth looks like this, but the internal structure of the earth is different. The structure of the earth can be divided into 3 parts as shown in the picture. These are: Crust, Mantle and Core.



Crust

This is the outermost layer of the earth. Its thickness is not the same everywhere. Its thickness is nearly 75 km. down from the surface of the earth. The crust is made up of soil and rocks but it has a hard layer.

Mantle

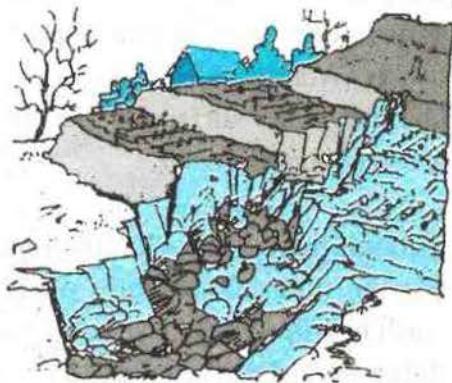
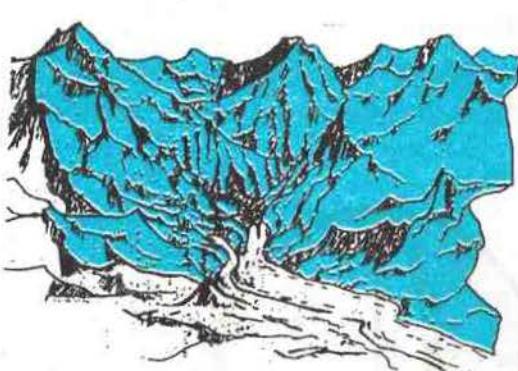
Mantle is the layer which lies below the crust and outside the core. Its thickness is nearly 2900 km. The temperature of mantle is more than crust but the rocks of this part are in solid state. Mantle is made up of silicates.

Core

It is the innermost layer of the earth. It is divided into two parts - Outer Core and Inner Core. The thickness of outer core is nearly 2000 km. In outer core minerals like iron, nickel etc. are in molten state. The thickness of inner core is approximately 1360 km. Iron and nickel found in this inner core are in solid state due to extremely high pressure. The temperature increases as we go deep into the earth.

Activity 1

Make the model of earth using clay, large lemon and other round objects showing the internal structure of the earth as shown in lesson.



The continuous changes in Earth's Surface

You might have seen muddy water in the river or rivulets in rainy season. Why does water become muddy? How the dust might be deposited on benches of classroom during the vacation? Have you thought? In rainy season, water carries the soil of weak surface of land and water becomes muddy. Air blows the dust particles. These dust particles get deposited on the benches. The earth's surface is eroded due to air, water, temperature, etc. and get deposited at other places. This process is known as soil erosion and soil deposition respectively.

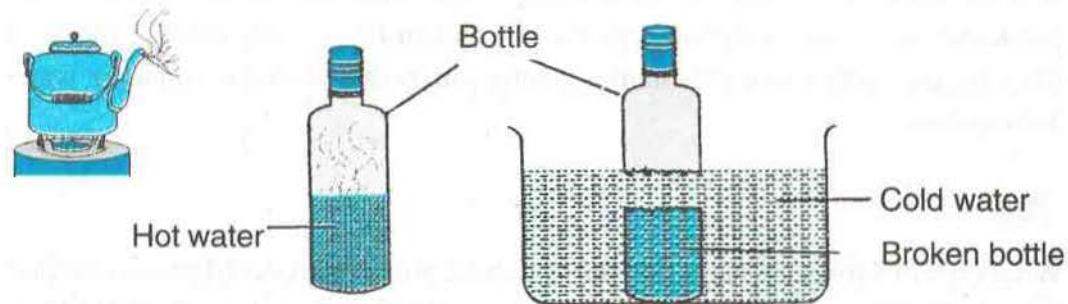
Soil erosion and deposition, flood, land slide, earthquake are frequently occurring on the earth's surface. These disasters cause change in the earth's surface. Earth's surface was not as it is at present and will not remain in future as it is at present. In this way, there is continuous change on the earth's surface.

Causes of Change on the earth's surface

What are the causes to bring changes on the earth's surface? To know these causes do the following activities.

Activity 2

Take a kettle with water as given in the picture and boil it as shown in figure. Take a pot with cold water. Now fill the boiled water upto the half part of bottle and keep it in cold water. Why is the bottle broken? Write the reason.

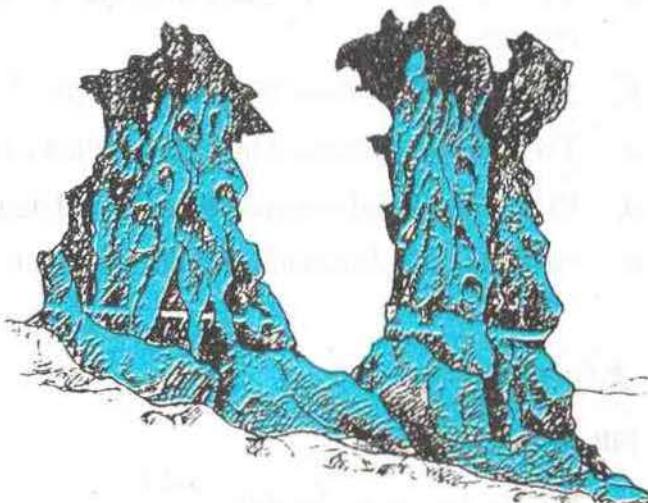


The temperature of rocks increases during day time due to sun light and decreases at night. Because of the rise and fall of temperature, rocks expand and shrink. If this process goes on for long term, rocks become weak and break.

Activity 3

Collect the dust of chalk and keep it on the table. Keep a black plastic near the table. Now blow the dust by moving a thick paper. Look at the plastic. What do you see? Find out the cause.

Wind causes storm. Storm carry away the soil, sand of land and deposits at other places. In this way, fast blowing wind erodes the surface of land or rock.



You might have seen the flow of rain water? It flows fast in the slope and flows slow in the plain. So water sweeps the surface soil very fast in the slope than in the plain. Rain water weakens the surface soil and river breaks the rock and sweeps along. The flowing rocks strike each other and break down and ultimately they get deposited in the plain. The river flowing from hill erodes and deposits in the plain.

People cut down trees of forest carelessly. The continuous overgrazing destroy the forest and soil becomes weak. Farming in slope without making terrace and development work make the surface soil weak. When the surface soil becomes weak and loose, rain water sweeps it away and air takes away to other place. In this way, the surface of earth changes continuously due to temperature, air, water and animals.

Activity 4

What type of surface of earth do you see where you live? Ask old persons to find out whether these land surfaces were the same from past or work made later. Find out the cause of change of surface on the basis of their answer.

Exercise 1

Tick (✓) the true and cross (✗) the false statement.

- a. The movement of the earth's surface by various causes is known as soil erosion. ()
- b. Mantle is the thickest layer of the earth. ()
- c. The plain area rounded by hills is called valley. ()
- d. River erodes and sweeps the rocks and deposits in the plain. ()
- e. Farming on a slope land without making terrace causes more erosion. ()

Exercise 2

Fill in the blanks.

- a. Rain water makes the soil

- b. The causes to bring changes in the earth's surface are air, water, animals and
.....
- c. Rain water sweeps the surface soil easily in than in plain.
- d. Rise and fall in the temperature the rocks.

Exercise 3

Answer the following questions in brief.

- a. How does rain bring changes in the earth surface?
- b. Write down the name of minerals found in the inner core of the earth.
- c. What are the major causes that change the earth's surface?
- d. What are soil erosion and soil deposition?
- e. How does heat of sun bring change in the earth's surface? Describe.

Information and Communication

Collected information and data about any topic is the information. To convey such information from one place to another place is called communication. We can get information from books, magazine, electronic media etc. Sources from where we get information is called source of information. Different sources can be used to receive different information. For example, if we need information about any incident occurred at a certain time, we can use the published information or materials printed at that time as a source of information. We can broadcast such collected information by means of radio, television, telephone, magazine, meeting, convention, electronic media etc. In this way, communication can be grouped into different types.

Types of sources of information

We can classify sources of information into different kinds. They are

- Books and periodic publication
- Reference materials and general collection
- Printing and electronic materials (means)

a) Books and periodic publication

We can divide written information (document) into two categories such as books and periodic publication. Facts are gathered from the received information from different sources of information at different times and a book is published.

Periodic publications are published at fixed interval of time. Newspapers, magazines etc. are periodic publications. Such publications are printed for a certain purposes. We read newspapers to know the present situation.

b) Reference material and general collection

While writing an article in a newspaper or magazine or a book, we have to gather information from different sources. Such sources are called reference materials. It is better to depend mainly on primary sources such as journal, newspapers etc. for reference materials.

We can also collect information of many sources in a book. Such sources are read by readers in order to keep general information rather than reference material. Therefore, a book is simply a collection of different types of information.

c) **Printing and electronic materials**

The information material present in the book, newspapers and library are printed materials whereas e-book, e-journal, database including information materials available in internet etc. are electronic materials.

Now-a-days, electronic means are also used to collect information fast. Both printed materials and electronic materials can be used according to the need of information.

Types of communication

People communicate with each other. Some informations have to be conveyed directly to the public. Radio, television etc. are used for this purpose. There are different types of communication as different means of communication. In this lesson, a brief introduction is given about different types of communication.

- a) Internal communication
- b) Inter personal communication
- c) Public communication

a) **Internal communication**

There is an internal communication in our body while thinking about something at solving some problems etc. For example, say, you tooks a T-shirt in one hand and a shirt in other hand. What reaction do you have in this case? You may say that shirt is better than T-shirt. In this condition, there is a communication between eyes and brain. In such communication, the same person is sender and receiver of communication.

b) **Inter-personal communication**

If you need exercise book, pen etc. you ask your parents. Your parents' response is 'yes' or 'no' for your demand. You can also talk with your friends on telephone, mobile etc. Such type of communication is called inter-personal communication, people know each other or one person knows the

other. Face to face talk, inter-view etc. are the examples of such communication. This is a two way communication.

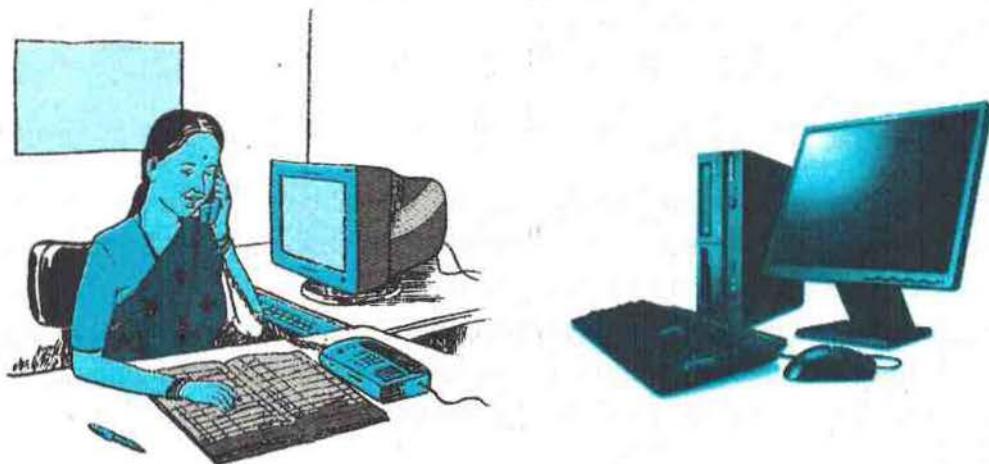
c) General communication

You might have listened to the radio or watched television. Any information can be broadcasted at once by radio or television to reach general public. Such type of communication is called general or public communication. Such type of information system is one way communication system.

c. Computer

Now-a-days, the use of computer has been increased. This is also an important means of communication. There are mainly three parts of computer: (i) Central Processing Unit (CPU) (ii) Monitor (iii) Key board/ Mouse

Keyboard/Mouse are input parts. These send the information in CPU. CPU processes the information and makes it meaningful. CPU is also called the brain of computer. Output can be seen in monitor. This output can be printed, recorded or install in other devices.



Computer can work as the means of communication after networking. We should contact the Nepal Telecom for networking. Internet can be run by connecting landline phone to the computer. We can send and receive the message by e-mail. With the help of internet the necessary website can be

searched and necessary information can be put there. We can exchange the messages by talking or writing to other online friends with the help of computer. It is known as chatting.

Now-a-days, people can talk in round table even though they live in different parts of the world with the help of computer. It is known as video conference.

Aeroplane, ship and rocket sent in space and other equipments can be conducted and controlled with the help of computer from any station. Therefore, computer is very important means of communication in today's world.

Activity

- Write the name of any two books and two periodic publications.
- Collect any two informations that you get from these books and periodic publication.

Exercise 1

Tick (✓) for true statement and cross (✗) for false statement.

- a. Periodic publications are published at an interval of fixed time. ()
- b. While writing an article, sources of information to be gathered are reference materials. ()
- c. In inter-personal communication, there is a communication within one person only. ()
- d. General or public communication is one way communication system. ()

Exercise 2

Fill in the blanks.

- a. Communication within one person is communication.
- b. Magazines are publication.

- c. When we need information we collect information from
newspapers, journal etc.
- d. After in computer, we can use it as a means of communication.

Exercise 3

Answer the following questions in brief.

- a. What is the difference between reference material and general collection.
- b. How is information conveyed in internal communication?
- c. How does computer work as a means of communication?

Teaching Instructions

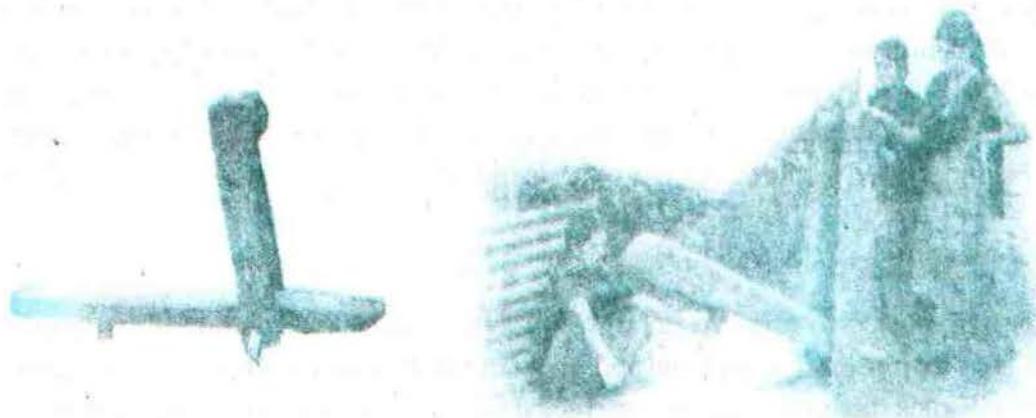
- Collect the different sources of information and show to the student to observe and use them.
- Show the chatting and searching the website to the student if possible.

Some Local Technologies

The life style of the people is being made convenient due to the development of science and technology. People used our lamp and diyalo in the past but now-a-days they are able to feel as a day in night also by the invention of electricity. Similarly, the technological development as solar battery, solar heater, electrical generator, etc have fulfilled their needs. In this chapter, we will study about the introduction and utilization of such technologies.

a) Husker (Dhiki) and grinder (jaanto)

Dhiki and store grinder (jaanto) were used before the use of modern machines for husking and grinding. Now-a-days, they are less in use due to the development of modern machines.



Husker (Dhiki)

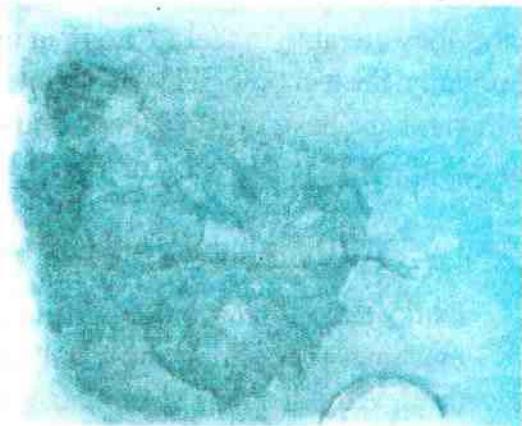
Husker (Dhiki) was used for husking rice and making beaten rice since ancient time. Husker (Dhiki) is made up of 2 m long wood. Its width is 15 cm and thickness is 10 cm. The tail part of husker (dhiki) is made flat to keep feet on it. It is fixed at its one third part horizontally to two wooden poles with wooden axle and is free to move about on it. A striker (musal) is fixed at the middle of front part. An iron-strip with grooved teeth (daati) is attached to its head. The striker (musal) is made to hit the store basket fixed to the ground. Effort is applied with feet at

the tail part to raise the front part and the striker (musal). The striker (musal) strikes the grains in basket when foot is released. This process is repeated several times and husking work is completed.

Grinder (jaanto)

Stone grinder (jaanto) is a traditional means used for grinding grains. It consists of two circular stone discs and a handle of wood called haato and an iron nail called 'maani'.

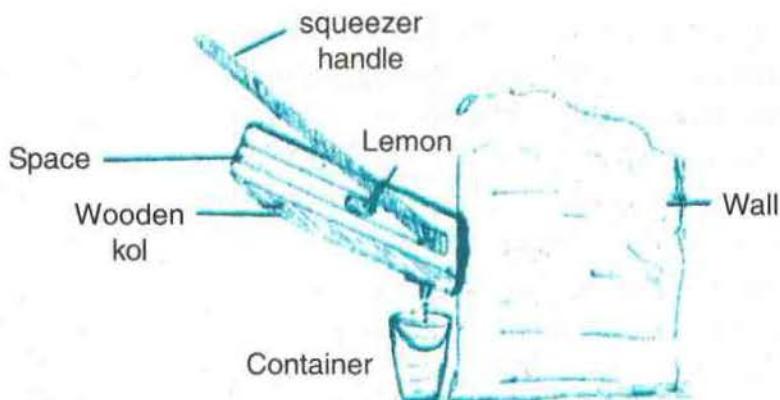
One stone disc is fixed to the ground with the help of iron nail (maani). It is immovable. The other disc has a small hole at its centre and a wooden handle is fixed to a hole near the edge. The upper disc is now put on the lower disc fixed to the ground so that the iron nail lies in its hole and the upper disc can rotate around it. While grinding, grains are put into the hole near to the nail (maani) and the upper disc is rotated with the help of wooden handle. In this way, while rotating, the flour or the ground substance slowly comes out from the grinders.



b) Kol

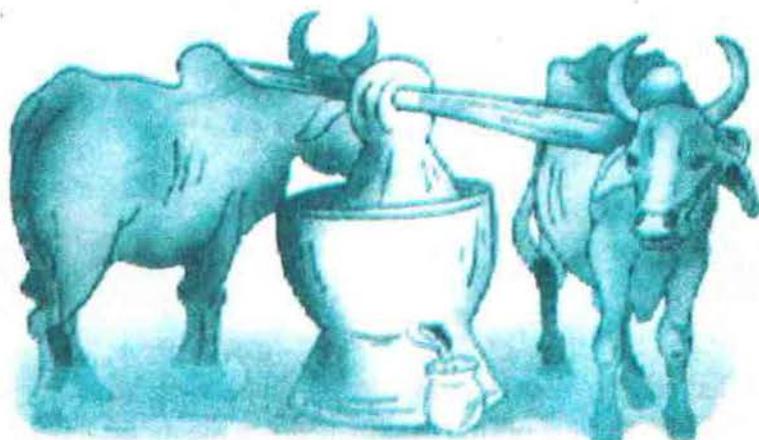
Kol is used to squeeze juice from juicy things such as sour fruits (lemon, big lemon, etc.), sugarcane and oil from mustard seeds. Though the structure of kol is different, but they are based on the same principle. The working of the kol is based on the principle that if a great pressure is applied on juicy things, juice present in them comes out due to great pressure when pressed.

The structure of kol used to press lemon, big lemon as shown in the picture. A hollow deep is made at the middle of a wood and a hole is also made near to it at the lower part. A small piece of wooden piece is put at lower level near the deep to support stick (biyo). This kol is fixed to the wall in inclined position. Now, a lemon to be pressed is put into the deep and is pressed with a wooden stick (biyo). When the effort is applied at the upper end of the



stick (biyo), lemon is pressed and the juice comes out and drained through the hole. This is collected and "Chuk" (sour substance) is made.

The structure of kol to be used for pressing mustard seeds is similar to the picture given here. The structure of this kol is a little different from the kol used for squeezing sugar cane juice. This kol is rotated just like sugar kol. In this kol a wooden bar is put horizontally into the musal. After putting the mustard seeds into the kol, the horizontal wooden bar attached to musal is rotated in circular path and the seeds are pressed. When much pressure is developed the oil is extracted from the seeds. The extracted oil is collected in the container through the small hole of the kol. Since more effort is needed to extract oil from mustard seeds, a pair of ox is used to move the musal.



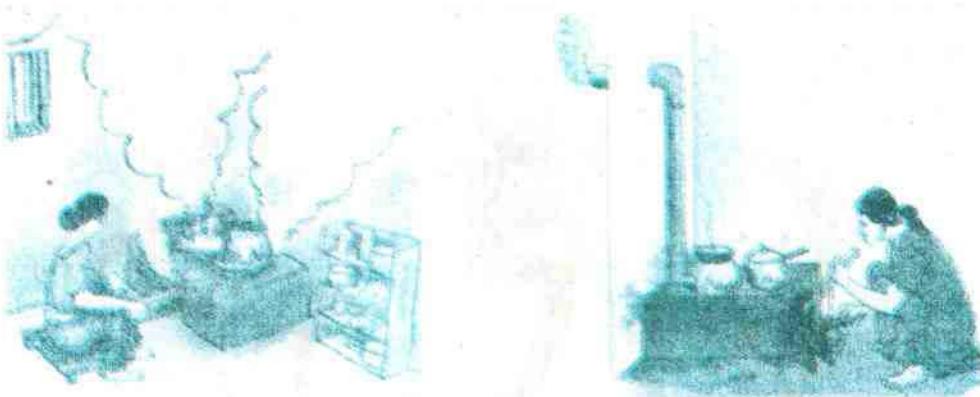
The residue in kol after extracting oil from mustard seeds is called pina. This is used as fertilizer in the crop fields.

The structure of sugarcane kol is like the mustard oil extracting kol. The sugarcane is cut into pieces or the whole sugarcane is put into the kol near the musal. The musal is inclined slowly and then dipped into the kol. Then the musal is rotated with the help of wooden bar attached to it. While rotating, more pressure is developed and juice is extracted from the sugarcane. This juice is drained through a small hole and collected in the container. People make chaku, sakhar (brown sugar) from the sugarcane juice.



Smokeless chulo

In village area, people are using firewood for cooking food. Traditional chulo is used for burning fire-wood. There are some weaknesses in our traditional chulho. For example, consumption of more fire-food while cooking food, producing excess smoke, possibility to cause fire as firewood is burnt in open place etc. Due to these weaknesses, necessity of modification is being felt. In traditional chulho, fire from fire-wood has to reach directly to both the mouth of chulho



but in modified chulho, there is a metal sheet in between first and second mouth of chulho. The excess heat of first mouth heats up the metal sheet and due to this heat, air upto second mouth also heats up. Also, the hot smoke coming from burning fire-wood reaches the second mouth of chulho. This heat helps to cook

food placed at second mouth of chulho. In this way, fuel is saved in modified chulho. Excess hot air goes out through the chimney attached before second mouth of chulho.

Thus, modified chulho helps to use energy properly. Smoke produced from chulho goes out of house through the chimney and it protects the adverse effects of smoke on our health.

Activity 1

How do people use dhiki and jaanto for husking and grinding? Write.

If there is any other technology used for husking and grinding near your house, write about them.

Exercise 1

Tick (✓) for true statement and cross (✗) for false statement.

- People use stone-grinder (jaanto) for grinding. ()
- The principle of mustard oil extracting kol and sugarcane juice extracting kol is different. ()
- Traditional chulo is useful than modified chulho (smokeless chulo) from the point of view of health.
- People use husker (dhiki) for husking. ()

Exercise 2

Fill in the blanks with appropriate words.

- The handle of stone-grinder (jaanto) is called
- In modified chulho, excess air goes out of house from
- Due to high juice from juicy things comes out of kol.
- is used as fuel to cook food on stove (chulho)

Exercise 3

Answer the following questions in brief.

- a) Write the working principle of kol.
- b) How do we use juice of sugarcane?
- c) Why it is necessary to modify traditional house stove (chulh).
- d) How does modified chulho help to use energy properly?
- e) Write in brief about the construction of stone-grinder (jaanto)

Exercise 4

Draw a sketch of Dhiki.

Teaching instructions:

- Take students for a short visit to show them Dhiki, stone-grinder (jaanto) and smokeless chulo.
- Make them to observe any of above technology if possible.
- During observation courage them to tell the things they know turn by turn.

Health Education

Personal Hygiene

Cleanliness of parts of human body

The way of keeping body clean and healthy is called personal hygiene. If proper attention is not given to personal hygiene, we may suffer from various diseases. We should develop good habit ourselves to remain healthy. Personal cleanliness includes taking care and cleanliness of the hair, nose, mouth, teeth, eye, skin, ear, genetals, etc.

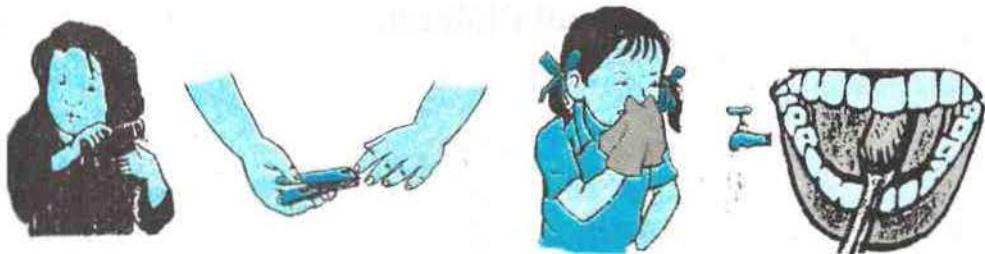
Way of Cleanliness of parts of human body

Our body is composed of head, trunk, hands, legs, etc. Nose, mouth, eyes are the organs of face. These organs are exposed daily with environment and become dirty. Therefore, we must clean these organs.

We must take bath regularly to keep head clean. It protects from dandruff and lice. We should wash hands with soap and clean water to protect us from diseases. Nose, eyes should be washed with clean water properly while washing face. If eyes are not cleaned, eyes get dirty cover while cleaning eyes and later may get conjunctivitis. Soft handkerchief and clean water should be used to clean nose. We should keep eyes open and sprinkle with cold water, while cleaning our eyes.

We speak and taste food with mouth. There are tongue and teeth inside the mouth. Teeth help us in chewing and grinding the food. If we don't brush teeth properly after meal, particles of food lodged between the teeth decay and cause the odour of mouth, infection in gum, decay toothache of teeth. We must brush our teeth with soft brush twice in a day. We should clean our mouth with water immediately after sweet food. We should use fluoride tooth paste which makes our teeth strong.

In order to keep our body clean, we must take bath. Taking bath helps to clean outer layer i.e. skin of the body. If skin is clean, it prevents us from itching and infections. We should keep clean our genetals and anus too. Urinating organs are called sex organs or genetals. Genetals are more soft than other external organs. These organs excrete the dirty things. We should wash these organs time to time by soap and clean water because most of the time these are covered.



Hands and legs are most used organs. Eating with dirty hands can cause stomach ache, dysentery, diarrhea, etc. We must wash our hands with soap or ash before and after having food, after touching dirty things, playing, toilet.

Our age passes day by day. We pass different stages such as babyhood, childhood, adolescence and finally we reach old age. Different physical and mental changes take place during these stages. Along with physical changes in adolescence, menstruation occurs in girls. The discharge of blood every month is called menstruation. It occurs later or sooner in each girl. It is a natural process therefore a girl should not feel shy or fear to take suggestion from mother, sisters or elders. At this time, vagina should be cleaned with clean water and sanitary pad should be used. Sanitary pad absorbs the blood. At this stage, nutritious food containing minerals should be eaten enough and special attention should be given to cleanliness.

Activity 1

Divide the students present in the class into 5/6 groups as per teeth, eye, nose, hair groups and present the way of cleanliness of an organ in a group.

Activity 2

Divide the class students in different groups. Wash your hands properly with soap and water and show them.

Exercise 1

Match the following:

Group 'A'	Group 'B'
Organ	Function
a. Teeth	() smelling
b. Eyes	() digesting food
c. Ears	() looking
d. Nose	() brush twice in a day () hearing

Exercise 2

Tick (✓) the true and cross (✗) the false statements.

- Eyes should be rubbed if dust enters.
- Teeth should be brushed after toothache only.
- Skin should be cleaned properly.
- Menstruation does not occur in boys.
- Nails should not be kept long.

Exercise 3

Answer the following questions.

- Write any five organs of our body.
- What happens if hair becomes dirty?
- Write the way of brushing the teeth.
- We should pay attention to which things during menstruation?
- What happens if nail is not cleaned?

Health Message

Let's clean organs of our body daily, prevent us from diseases and save others.

Teaching Instruction

- Centre your teaching on the problems created by carelessness of personal hygiene.
- Try to create amiable environment to inform the boys and girls about the changes in adolescence.
- Show the way of brushing teeth in class and make your students to brush their teeth.

Exercise, Rest and Sleep

We all want to keep the body clean, healthy and smart. Our habit and behaviours should be healthy to remain healthy. Personal cleanliness as well as regular exercise, rest and sleep are necessary to remain healthy. Healthy habits like safe and balanced diet, wearing the clothes according to season, etc help to remain healthy.

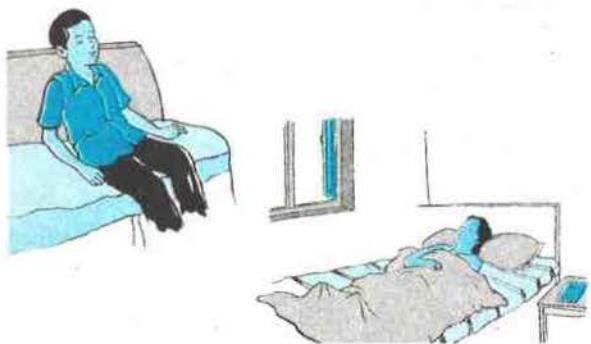


Importance of Exercise

The physical activity that enables different parts and organs of the body to move several times is called physical exercise. Physical exercise helps to make the organs of our body healthy, and strong. For this, we should take part daily in minor (simple) games and exercise organized in school. Physical exercise and game develop the qualities of leadership, mutual co-operation, co-ordination, etc. Sports and exercise, balanced diet and rest should be done in a balanced way according to need. Rest helps to avoid tiredness of all organs of our body. All the people should do physical exercise regularly according to the age. Physical exercise helps to digest food easily. It increases appetite and develops strength, agility, sleep, etc.

Regular Rest and Sleep

Have you seen machines in factories? Machine can not run if any part is defected. We become unhealthy if any organ does not function. Therefore all the organs of body need a regular exercise and rest. Old person and children need more rest than adults. We must sleep well (sound sleep) to give rest to our body. While sleeping, we should not bend the legs and cover the face. Generally, we need 8-10 hours of sleep



everyday. We should make a habit to sleep early and get-up early. The sleeping room should be quiet and well ventilated. Good digestion, loss of fatigue, increasing memory power, etc. are some of the advantages of rest.

Activity 1

Discuss and enlist the causes of necessity of sleep, exercise and rest and present it in the class.

Exercise 1

Fill in the blanks with suitable words.

- We need regular to remain healthy. (*running, sleeping, diet, exercise*)
- We should eat to keep body healthy. (*maize and soyabean/ vegetables/ balanced diet*)
- Sleeping room should be clean and well ventilated as well as (*cold/dark/peaceful*).

Exercise 2

Answer the following questions.

- Write any four factors to remain an individual healthy.
- Write any four advantages of physical exercise.
- What are the advantages of rest and exercise?

Health Message

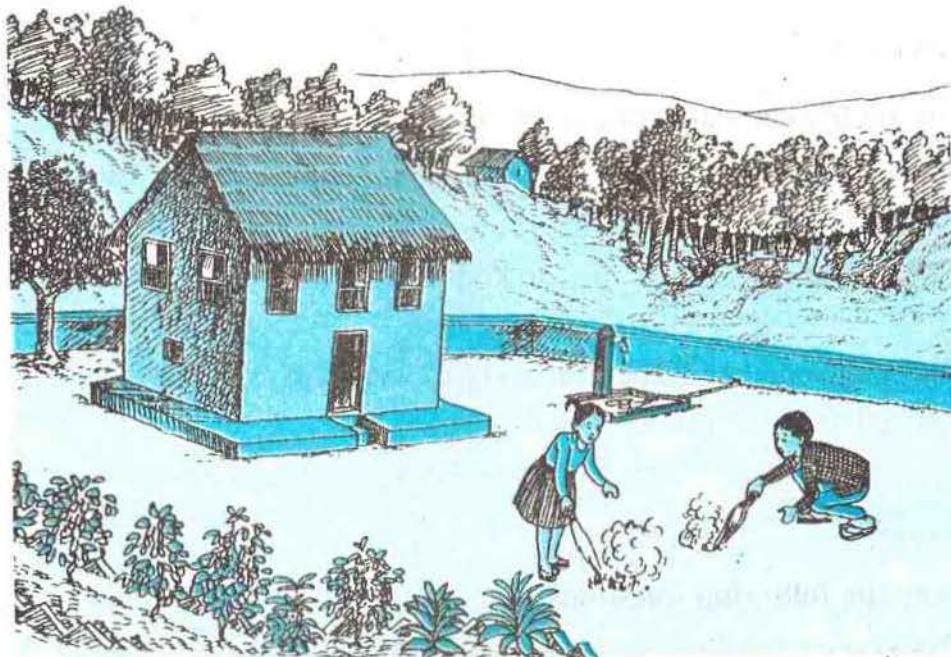
Let's do regular exercise and take rest and learn to be healthy to live.

Teaching Instructions

- Concentrate your teaching on life skill based healthy habits and behaviours to remain healthy.
- Give the practical examples to show the importance of balance diet, regular exercise and rest.
- Provide more information about the importance of physical exercise and rest.

The Need of Environmental Sanitation

Krishna Lama and Hare Ram Chaudhari are close friends. They study in the same school. Yesterday, teacher taught the chapter 'Importance of Environmental Sanitation'. So, they are walking and talking about the same lesson.



- Hare Ram : Krishna, have you understood the meaning of environment?
- Krishna : Oh, according to my understanding, state of our surrounding like river and rivulets, forest, street, birds and animals, house, shed, school, etc. is called environment. Therefore, teacher said to pay special attention to environmental sanitation.
- Hare Ram : What harm have we done to environment due to which we should pay special attention to environmental sanitation?
- Krishna : I had also thought so earlier but it seems to be quite different. All the work what we do from morning to evening are related to environment. We didn't understand and so, we are degrading the environment.
- Hare Ram : How? I didn't understand at all.

- Krishna : My grandfather said that our village was not so dirty before. There was a forest nearby our village. There was no problem of fodder and firewood because of dense forest. There was no facility of drinking water but there were more resources of water. There was no facilities of market and no such pollution due to plastics.
(Stopping to Krishna)
- Hare Ram : What are you saying? Have the development work, construction and facilities degraded environment?
- Krishna : Do not cross the points without understanding. Listen, I do not mean we should not utilize the physical facilities. I mean we should apply the measures of keeping environment clean and balanced. We should make drainage while making the tap. We should plant trees on barren land. Plastic bags should not be thrown carelessly. Instead, we should dispose in proper place. Not only this, environment pollution may increase with development work. Therefore, teacher said that great problems may come if environmental sanitation work is not done.
- Hare Ram : What type of problems?
- Krishna : The great problem is the problem of health. Wastage thrown everywhere spreads the bad smell. In such place the germs multiply and the people of these areas and pedestrians are mostly affected. Do you memorize what sir said yesterday?
- Hare Ram : What did he say?
- Krishna : The effect of our own residential environment is great to spread diseases. We remain as healthy as our environment remains healthy, neat and clean. So we should be careful in environmental sanitation. He did say that keeping environment clean is the duty of all of us?
- Hare Ram : Friend, we are unhealthy if environment is dirty, aren't we?
- Krishna : Of course, there is great role of sanitation to remain healthy.
- Hare Ram : I realize that I haven't understood many things. Now I will motivate all the member of our community not to throw garbages everywhere. Garbage should be buried in a pit or kept in nearby container. Similarly, I will make the members aware that to keep environment clean is our duty.
Talking in this way, they reached a cross-road and they went towards their home.

Activity 1

Observe your own community. What activities are done by your neighbours. How can you help to control it? Fill in the table in a group and present it in the class.

S.No.	Activities of pollution	S.No.	Your help to prevent pollution
1.		1.	

Exercise 1

Tick (✓) the correct and cross (✗) the wrong statement.

- Environment consists of living and non-living things. ()
- We do not get sick if environment is polluted. ()
- The environment of house is dirty if we do not clean it. ()
- It is the duty of all of us to keep the environment neat and clean. ()
- The wastages produced from house should be kept in container. ()

Exercise 2

Answer the following questions.

- What is environment?
- Write any three reasons for maintaining environmental sanitation?
- What should we do to manage the wastage caused by development work?

Health Message

It is our duty to keep the environment clean and healthy.

Teaching Instructions

- Concentrate your teaching on the concept of environment and importance of environmental sanitation.
- Concentrate your teaching to change in wrong concept and behaviour regarding environment that bring life skill and observe their behaviour time to time.
- Concentrate your teaching that the role of students is important in management of wastages.
- If possible, involve the students in acting in role-play of this chapter.

Solid Wastes

We use various things in our house. The things that are thrown after use are called wastes. These things mix with other substances and change into solid wastes. Solid wastes come out from household, garden, industries, school, market places, etc. Solid waste can be divided into two types

- a. Wastes that get rotten
- b. Wastes that do not rot

a. Wastes that get rotten or decaying wastes



Decaying things are also called organic matters. These things are wilted plants, herbs, dead animal, residue of vegetables, etc. Similarly, papers, piece of wood, old clothes, leather, old straw mat, carpet, sack of jute, etc. also come under organic wastes. These organic things convert into soil after decaying.

b. Wastes that do not rot or non-decaying wastes

Non-decaying wastes are also called inorganic things. Plastic, glass, metal piece, etc. come under inorganic things. The large amount of wastes

increasing day by day make the problems more complicated. We should learn how to manage these wastes to solve the problems created by wastes. There are several ways to manage wastes, for example producing less wastes, reuse or recycle, etc.

Rupees from refuse

In order to manage wastes, at first we should classify the wastes as organic or inorganic. Among the inorganic wastes, plastics, metal (iron, copper, bronze, aluminium, etc.) and the bottle should be separated. These materials can be recycled and sold to Scrap Hwaker (KABADI).

The environment is polluted if organic wastes are thrown everywhere. Such wastes convert into compost by decaying. For this, a pit should be dug at safe place away from home and organic substances should be kept in that pit, or should be store. The pit should be covered by plastic to protect it from rain. All the household garbage should be put in that pit. The upper level waste should be turned to the bottom and the bottom level waste should be turned to the upper level from time to time. After few weeks it changes into compost. Such compost makes soil fertile and the environment is neat and clean. Vegetables and cereal crops produced using compost are useful for our health.

Activity 1

What kind of wastes usually come from house, school and shops? Make a list of organic and inorganic wastes coming from house, school and shop.

Exercise 1

Tick (✓) the correct and cross (✗) the false statement.

- Water used for cleaning utensils is solid wastes. ()
- Organic waste can decay in short time. ()
- Compost manure can be prepared by the wastes that decay. ()
- Plastic is the waste that does not decay. ()
- Compost manure is the best for kitchen garden. ()

Exercise 2

Match the following

Group A	Group B
a. Leafage	() can be reused
b. Wastes	() do not decay
c. Bottles of Cocacola	() decaying wastes
d. Iron	() pollute the environment
	() compost can be prepared

Exercise 3

Answer the following questions.

- What do you understand by the solid wastes?
- Write the name of any five wastes coming out from school.
- How is environment polluted? Write any two causes.
- How is compost manure prepared? Write.

Teaching Instructions

- Concentrate your teaching mainly on less production and ways of management of wastes.
- Concentrate your teaching to develop life skill for keeping house, school, community clean.
- Teach them practical knowledge and skill to manage the wastes of surroundings.

Balanced diet



Fresh and balanced diet make our body healthy. Eating of unhygienic and unbalanced diet causes the possibility of diseases. We usually eat dal, rice, vegetables, grams, etc. daily. All the nutrients that are essential for our body may not be available in these foods only. We must have a balanced diet, which contains the right amount of nutrients to fulfill the requirements of the body. What type of food is essential for balanced diet depends on the nutrients that it contains. The food that contains all essential nutrients like carbohydrate, protein, fat, minerals, water and vitamins in the right proportion and amount for our body is called balanced diet. These nutrients must be present in our daily diet.

- Carbohydrates** : Rice, maize, wheat, barley, buck wheat, millet, potato and other sugar enriched food, etc.
- Protein** : Pulses, beans, cowbeans, nuts, soyabean, cashew nut (kaju), milk, curd, cheese, fish, meat, egg, grams, etc.
- Fat** : Oil, ghee, meat (sheep, goat, buffalo, chicken, boar, pig), butter, etc.
- Minerals** : All kinds of green vegetables, lettuce, spinach, sisnu, gundruk (dried spinach), Karkalo, coriander, fruits etc.

- Water** : Clean and safe drinking water.
- Vitamins** : Papaya, mango, apple, orange, banana, lemon, pomegranate, green vegetables, fish, meat, rice, seedling of grains etc.

Things to consider to prepare balanced diet

Among the nutrients given above carbohydrate and fat are energy giving food, proteins are body building food and minerals and vitamins are protective food. To prepare balanced diet we should divide the foods into six groups such as grain, fruit and vegetable, pulses and gram, milk and milk products, meat and egg, drinkable liquid like water and others. We get nutrients from all these groups. Pregnant mother must eat grains and pulses, green vegetables, meat, fish more than other people. Children, old age people, youth, pregnant mother or according to the age and nature of work require nutritious food to prevent from malnutrition.

Activity 1

Make a list what you and your friends ate in the morning.
Make a table of these foods on the basis of nutrients.

Activity 2

Is there lack of nutrients in your food that you eat? Discuss with your friends.

Exercise 1

Choose appropriate word and fill in the blanks.

- We should always eat (balanced diet, food containing protein, food containing vitamin)
- Rice contains (minerals, carbohydrate, fat)
- Balanced diet makes body (healthy, weak, fat)
- Children and pregnant women should always eat food. (nutritious, too much, same type of)

Exercise 2

Tick (✓) the correct and cross (✗) the false statement.

- We should always eat same type of food.

- b. Vitamins protect us from disease.
- c. The people of all age and condition should eat the same type of food.

Exercise 3

Answer the following questions.

- a. What type of food is called balanced diet?
- b. List the foods that give energy in our body.
- c. Write the name of any five grains available in our village.

Teaching Instructions

- Concentrate your teaching on the foods available in own community.
- Divide students in different groups and make them to classify foods on the basis of nutrients and make an environment to demonstrate.

Cause of Malnutrition and its prevention

Fat man is generally considered healthy in our society. Thin man is considered unhealthy and weak. But health education does not agree with both condition. Health education teaches us that there should be balance between height and weight to remain healthy. We should eat carbohydrate, protein, fat, vitamins and minerals for this. We get all nutrients from our daily food. If there is a continuous shortage or over of nutrients in our food, then we suffer from malnutrition.

Children do not get proper physical development due to malnutrition. Night-blindness, marasmus, anaemia, rickets are caused due to malnutrition.

Night-blindness

The inability to see in dim light or evening is called night-blindness. People suffering from this disease can see in day time as others. Due to lack of vitamin 'A', this disease occurs. If mother does not get vitamin 'A' in pregnancy, child may get night blindness. Diet rich in vitamin 'A' such as green vegetables, yellowish fruit, carrot, pumpkin, milk, ghee, fish, liver, etc. can be taken for prevention.

Marasmus

The condition in which the body becomes deficient in both carbohydrate and protein and turns skinny is known as marasmus. It is caused by unbalanced food in children and by other infectious diseases. Infant and children below five years must be provided nutritious food to save from this disease.



Anaemia

The deficiency of blood in body is known as anaemia. This is usually common in children and pregnant women. A diet deficient in iron rich food, worm infestation, excessive bleeding are some of the possible causes of anaemia. To prevent this disease we must take food containing iron, such as green vegetables(spinach, mustard, coriander leaves, latte, bethe, spinach, etc), GUNDRUK, fish, liver, etc.

Preventive measures of Malnutrition

Pregnant mother should be provided nutritious food. A baby should be breast fed at least for two years. Vegetables, fruits and grains available in home from kitchen garden should be fed with balanced diet. Similarly, a complete dose of immunization must be given within 5 years.

We cook various foods in our kitchen. We are destroying some of nutrients in cooking unknowingly. If we preserve nutrients of food, we get nutrients essential for our body. To preserve the nutrients in food, we should adopt the following measures.

1. The rice grain should not be washed too much and ricegruel (maad) should not be thrown but this can be added to lentils and vegetable curry.
2. Don't take stale food.
3. Vegetables should not be over-cooked.
4. Too much fat and spice should not be used.
5. Vegetables should be washed first then cut.
6. Fruits should be properly cleaned and cut only before eating.

Activity

Make a list of ways to preserve the nutrients in food and paste in your classroom.

Exercise 1

Match the following.

Group A

- Night-blindness
- Anaemia
- Marasmus
- Communicable diseases

Group B

- Deficiency of carbohydrate
- Source of iron
- Deficiency of Vitamin 'A'
- Deficiency of iron
Transmits from one person to another

Exercise 2

Tick (✓) the correct and cross (✗) the false statement.

- A man is fat by malnutrition.
- Anaemia is caused due to deficiency of Vitamin 'C'.
- Nutrients destroy in rice grain by over washing.
- We should always eat nutritious food.
- Vegetables should not be over cooked.

Exercise 3

Answer the following questions.

- What is malnutrition?
- What types of food should be eaten to prevent from night-blindness?
- Write any five preventive measures of malnutrition?
- Write any five measures while cooking food.

Health Message

"Let's eat nutritious food. Let's save ourselves and others from malnutrition".

Teaching Instructions

- Concentrate your teaching on the physical, mental and social effects caused by malnutrition.
- Concentrate your teaching on the harms if the nutrients can not be preserved in our daily diet.
- Give the example of practicable things.

Communicable Diseases

We can do lots of work if we are healthy. Healthy person can make family happy and prosperous.

There are two types of diseases, communicable and non-communicable. A disease caused by specific pathogenic germs and transmitted from one person to another person is called communicable disease. Tuberculosis, cholera, measles, common cold, whooping cough, HIV, AIDS etc. are communicable diseases. Such diseases can be transmitted from one person to another person easily. Sometimes we see the people suffering from cancer, asthma, goiter, diabetes, etc. Such disease are non-communicable diseases. These diseases are not transmitted from one person to another person.

People suffer from diseases due to different causes. Some of the causes are polluted environment and climate, lack of sanitation, unhygienic food. Symptoms of disease are seen when disease attacks. The sign seen after attacking a disease is known as symptom. We should do physical exercise daily to prevent from diseases. Personal hygiene and surrounding where we live should be clean.

Some Communicable Diseases

1. **Tuberculosis (T.B.)**

It is communicable disease caused by a germ. This disease may attack the parts of the body like lungs, intestine, bones, etc. The patient may suffer from continuous cough for two weeks or for a long time in case of lungs or chest tuberculosis. After sometime, blood may be seen with the sputum. This disease is spread through coughing, sneezing in air. Similarly, it can also be transmitted by the patient's unsterilized utensils and clothes. Patients should cover their mouth while coughing or speaking. This disease can be cured by taking the medicine daily. B.C.G. vaccination should be given immediately after child birth for the prevention of it.



2. Chickenpox

Chickenpox is a communicable disease which attacks mostly the children under the age of 10 years. Sometimes it can also attack adult person. It is caused by virus. The symptoms of chickenpox are mild or moderate fever, headache, loss of appetite. After sometime red spots appear on back and face. Slowly red spots turn into fluid-filled blisters and then dry up after 4/5 days.



Chickenpox may be transmitted by using unsterilized utensils, handkerchief, etc. and other goods of patients. The patient suffering from chickenpox should be kept away from other children for a week. Utensils and other goods should be cleaned or sterilized before using.

3. Whooping Cough

Whooping Cough attacks respiratory track. It usually affect children below 5 years. This disease is caused by virus. The causes of this disease are malnutrition, ignorance in caring, pollution, cold environment etc. It starts with common cold. The mild fever is noticed and cough continues without sputum and the sound ‘whoop’ is emitted. The clothes, utensils and left over (jutho) food should not be used by others. D.P.T. vaccination should be given to the children in time.

4. Measles

It is a disease common to children above 6-9 months of age. It affects skin, eye, respiratory tract, lungs and intestine. Loss of appetite, nose becomes watery and gets fever. Red spots appear on the skin of the face and neck and on back of ears. Children should be vaccinated between 6-12 months to prevent this. Clothes and utensils and other materials used by the patients should be boiled in water or cleaned. Mucus, sputum, etc. disease should be buried in proper place.

5. Cholera

Cholera is an epidemic disease. Cholera is caused by virus. Contaminated water, lack of personal hygiene and sanitation, stale and rotten food cause cholera. In this disease, vomiting and diarrhoea occur at the same time. The patient passes watery stool frequently. It may attack the people of all the age.



Vomit and stool should be buried to be safe from this disease. Stale and rotten food should not be used. To prevent from cholera, hygienic and nutritious food should be eaten. Therefore, we should pay attention on hygienic behaviour, sanitation and cleanliness, regular exercise and nutritious food to prevent from all types of diseases.

Exercise 1

Match the following

Diseases

- a. Measles
- b. Whooping cough
- c. Tuberculosis
- d. Chicken pox
- e. Cholera

Symptoms

- () Blood in sputum
- () Red spots appear
- () Watery stool
- () Fluid-filled blisters appear
- () Continued coughing
- () Blood in stool

Exercise 2

Answer the following questions.

- a. What is communicable disease?
- b. What are non-communicable diseases? Write the name of any five.
- c. What are the symptoms of tuberculosis?
- d. Write any five causes of disease.
- e. Write the symptoms and preventive measures of whooping cough.

HIV and AIDS

HIV (Human Immunodeficiency Virus) is a kind of virus. When a body is infected with HIV, it destroys the immune system of body. Such people is called HIV infected people. The person is not considered as having AIDS, though the virus enters the body. It takes many years to have AIDS even in infected people.

The full form of AIDS is Acquired Immune Deficiency Syndrome. This is the state of body in which immunity power becomes weak and various symptoms of various diseases are seen. In this condition even simple diseases cannot be cured. This condition is called AIDS.

An infected people, does not know its symptoms for long time. Blood test should be done in laboratory to detect the infection. We should show the same behaviours to HIV AIDS infected person as we show to others. Infected person needs more love, affection, sympathy, care, etc. than others. Infected person should not be discriminated.

HIV is transmitted from one person to another by the following means.

1. Unsafe sexual contact with HIV infected person
2. Piercing a skin with unsterilized blade, knife and other instruments used by infected person.
3. Sharing or reusing of infected needles or syringes.
4. Transfusion of HIV infected blood.
5. HIV infected mother giving birth to a child.

AIDS is not transmitted by

1. Shaking hands or playing together.
2. Sharing bathroom, kitchen and eating together.
3. Sharing personal items like comb, soap, clothes, etc. or touching or hugging.
4. Bite of infected mosquitoes or other insects.
5. Coughing and sneezing.
6. Caring and nursing infected people.

Exercise 1

Tick (✓) the correct statement and cross (✗) the false statement.

- Needle and syringe should be shared in a group. ()
- HIV and AIDS infected blood and organs should not be used in other people. ()
- HIV and AIDS can be transmitted by unsafe sexual behaviour. ()
- HIV and AIDS can be transmitted by using same utensils, hugging with infected people. ()

Exercise 2

Answer the following questions.

- Write the full form of HIV and AIDS.
- Write the symptoms of HIV and AIDS.
- Write the preventive measures of HIV and AIDS.
- Write any five condition that HIV and AIDS are not transmitted.
- How is HIV transmitted?

Safety and first Aid

To prevent from accident, we should not be careless while playing in field, walking and working in home and factories. All the measures to prevent accident is called safety measures.

Sometimes accidents may occur despite all the efforts also. In such situation one needs first aid. The immediate treatment provided to an injured person at the place of accident before taking him/her to healthpost or hospital by medically trained personnel to save the life is called first aid. It prevents the situation from worsening. It prevents pre-mature death.

If there is a severe wound, a victim should be kept at comfortable place and given a rest. Wound should be washed with lukewarm water and soap. After washing the wound, it should be covered with a clean piece of cloth and take him/her to health centre. In village area, thorn, piece of glass or sharp edged object may prick. The rusted object may cause tetanus. In such condition needle should be sterilized before using. In snake bite, the patient should be kept calm and should not move. The part of body just above the bitten area should be tied with a bandage or a rope that prevents the poison from spreading quickly. If dog bites, wound should be washed with clean water and soap. Anti-rabies injection should be given.

We should keep a first aid kit at our home that helps to provide first aid during accident. There must be scissor, knife, blade, cotton, bandage, soap, cetamol, jivan jal, spirit or dettol, thermometer, etc in the kit. We should suggest and encourage our friends to keep such kit at home.

Activity 1

What type of accidents have occurred in your surrounding? Ask the community member or family member, write and present it in your class.

Activity 2

Prepare first aid kit with the help of friends and class teacher.

Exercise 1

Fill in the blanks with appropriate word.

- a. Accidents cause the loss of
- b. To prevent from accident, we should adopt
- c. Safety measures in work or sports save
- d. While crossing busy motorable road, we should follow

[property and life, traffic rules, alertness, from loss of, accident]

Exercise 2

Answer the following questions.

- a. What are the accident and safety?
- b. What measures should be adopted to save ourselves from accidents?
- c. Write any four advantages of prevention of accidents.
- d. Make a list of possible accident in classroom.

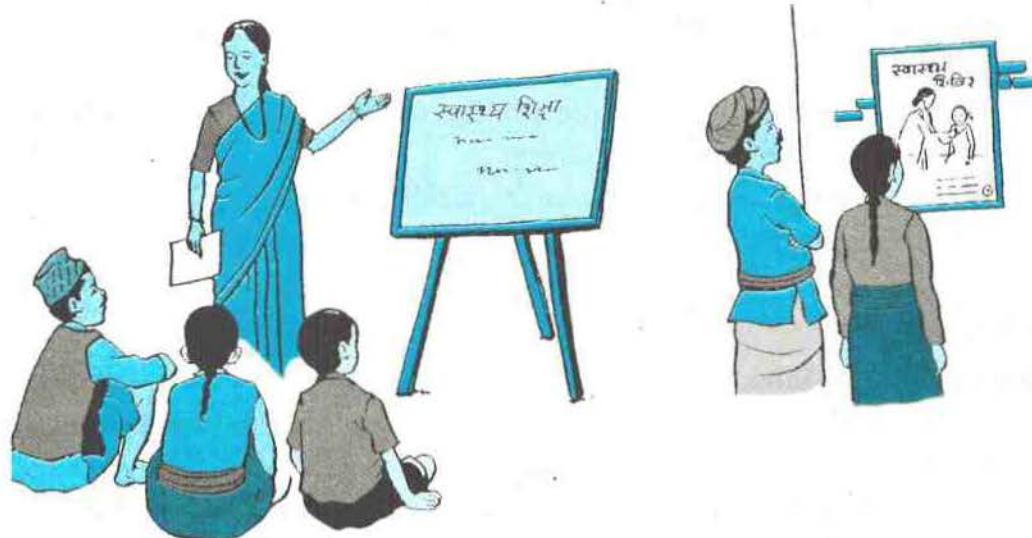
Health Message

Let's save ourself and others from accidents.

Health Services and Community Health

A community is formed when different families live together. We all are the members of community. We should pay attention to our food behaviour, exercise and rest, etc. to remain healthy. Health services are provided by health organizations to remain healthy. Health organizations are those institutions which provide health counselling and necessary help to the people. We should take suggestion and services from these institution to remain healthy.

Community health is a joint effort to make good health of community people. It helps to make the people aware by providing information about available health services. In the past, sanitation was considered as community health but now its scope is very wide. Community health includes preventive, curative, promotive and rehabilitative aspects of health. Community health can not be improved by the effort of an individual. All the members of community should be responsible equally.



Hygienic food and safe drinking water must be managed for community. Attention should be paid to construct public latrine as well as personal hygiene and collective sanitation. Besides these, all the members of community should manage garbages properly. Programme should be organized to make the people aware of child health, family health, communicable and non-communicable

Exercise 1

How can first aid be provided if following accidents occur?

- Deep wound and injuries
- Snake bite

Exercise 2

Answer the following questions.

- What is accident?
- What is first aid?
- What are advantages of first aid? Write.
- What types of material are needed in first aid-kit? Make a list.
- Where is first aid provided and Why?

Teaching Instructions

- How is first aid being provided in local area's accidents?
- Concentrate your teaching on demonstration and discuss its advantages and disadvantages.
- Discourage unscientific first aid

Exercise 3

Answer the following questions.

- a. What is health service?
- b. What types of health aspects are included in community health?
- c. Who plays the main role to improve the health service in the community?
- d. Who are the persons to provide the health services in the community? Write the name.

Health message

"Let's visit nearby health institution and also take others if we have health problem."

Teaching instructions

- Concentrate your teaching to make the people to visit hospital when they are sick.
- Make them to learn useful life skill, increase knowledge and change in their thinking.
- Give information to your students about primary health care centre, health post, health centre (sub-health post) and hospital and health services provided by these institutions.

diseases to improve the environment of community. Programme should be conducted to bring change in the superstitions like dhami, jhankri,etc.

There are different institutions to provide health services in the community such as hospital, primary health care centre, health post, sub-health post, etc. There are doctor, nurse, health assistant, etc. to give suggestion, to treat and care. Therefore, we should go to hospital or health post to get health services when we are sick. We should go to health institution and take information and suggestion about health from time to time.

Activity 1

Make poster (16" x 14") to give health awareness in your community and paste in the classroom.

Exercise 1

Choose the correct word from the bracket and fill in the blanks:

- provides health services in villages. (**Teacher, Health worker, Engineer**)
- The place, where health services are given is called (**health post, community building, illaka office**)
- To improve the community health, the help of is required. (**individual, institutions, community**)
- We should go to to take the health services. (**hospital, dhami and jhankri, pharmacy**)

Exercise 2

Find out true or false.

- The services that should be taken to improve our health before or during sickness are called health services.
- The role of health worker is a major role to improve the community health.
- We should visit dhami, jhankri to take suggestions about health.
- Hospital is the only institution to provide health service in the community.

Teacher : Of course, we should go for treatment to such health services. We should help our family member and other community people to take them there. We should take all the people to health post instead of traditional healer (dhami, jhankri, etc)

Students : We had little knowledge on this topic, miss. Now, We will publicize in our family and other members of the community to go to health post and take health services.

Teaching Instruction

- Concentrate your teaching to develop the positive attitude towards the health services.

Activity 1

Act as a doctor, sick people, nurse, health worker and their services in the class.

Exercise 1

Find out true or false.

- a. Sick people should go to hospital.
- b. We should check our health from time to time.
- c. We should help to take sick people of community to health institution.
- d. We should not give a chance to establish health post in our village or community.

Exercise 2

Answer the following questions.

- a. Where should we go during sickness?
- b. Write any five services available in hospital.
- c. Why should we do publicity about health services?
- d. What is a mobile camp?

Utilize Health Facility and Help Others

(Teacher and Students of class-V are discussing in the classroom.)

Teacher : Hari, tell me why didn't you come to school the day before yesterday?

Hari : Miss! I had suffered from fever the day before yesterday. So, I couldn't come to school.

Teacher : How are you today?

Hari : To-day, it's O.K., miss.

Teacher : What did you do in fever and where did you go?

Hari : I was checked at health post of our village and took medicine. Now I am fine, miss.

Teacher : Thank you, You did well.

You should teach this others also. We will study and discuss on this topic today.

Hari : O.K., miss.

Teacher : Health service is the service which is utilized before or during sickness.

Student : From where these services can be taken, Miss?

Teacher : We can get these services from sub-health post, health post, primary health care centre, hospital of our community. Sometimes, mobile camp also comes to village and provides such services.

Students : Who provides such services, miss?

Teacher : Usually health assistant, health worker provide services. If the problem is complicated, they refer to the doctor of hospital.

Students : We and other people of community should go to hospital during sickness, shouldn't we?



Activity 2

Conduct an oratory program in the presence of teacher in the classroom on 'Smoking leads to death'.

Exercise 1

Fill in the blanks with appropriate word.

- Smoking means
- Smoking by pregnant mother also effect the
- There are 4000 harmful in tobacco.
- The harmful substances in tobacco causes
- I want to suggest my family member not to

Exercise 2

Match the following:

Group 'A'

- Khaini
- Cigarettes
- Cancer
- Coughing
- Nicotine

Group 'B'

- Long term effect of smoking
Short term effect of smoking
Intaking of smoke
Eyes become smaller
Chewing tobacco
Harmful substances of tobacco

Exercise 3

Answer the following questions.

- What is smoking?
- Write any four immediate effects of smoking.
- Write any four preventive measures of smoking.
- How are people trapped in smoking? Write any three causes.
- Write the name of harmful substances of tobacco.

Health Message

Healthy environment and smokefree life is good for health.

Smoking

Intake of smoke from tobacco is known as smoking. For examples, smoking is inhaled by hukka or bidi. Using of cigarettes, bidi, tobacco, etc is a smoking. Data shows that one arab twenty crore people smoke in the world. People in the world use the tobacco in two ways:

- Intaking smoke:** cigarettes, bidi, tamakhu, etc.
- Chewing tobacco:** Khaini, jarda, panparag, etc.

Different studies show that there are more than 4000 harmful chemical substances in smoking. Among them nicotine, tar, carbon-monoxide, etc are also some chemical substances. While smoking, these substances reach the various parts of body which may lead to various diseases such as heart diseases, cancer, asthma, teeth problem. Smoking is very dangerous not for only pregnant mother, but also for foetus (unborn child insider her).



It affects not only smoker, it also affects those who are sitting or standing nearby. It affects more children of tender age. We must not intake smoking by the friend's or any other's pressure for imitation and for showing off to others. In the beginning people use it without the knowledge of its bad effect or due to bad company. If we see it in the family or in the society, we should suggest not to smoke. We should change our behaviours to protect from smoking. We should adopt the following measures to protect ourselves from smoking.

1. Strong commitment not to smoke.
2. Keep away from smoker.
3. If the family member smokes, suggest him/her not to smoke.
4. Make school area 'No smoking zone'.
5. Participate in the publicity programme against smoking and make others also to participate.

Activity 1

Make a group of class friends and write some slogan against smoking. Conduct a rally against smoking.

c. Programmes against alcohol and drugs

We should never use alcohol to remain physically, mentally healthy. We should make our family aware and society about the effects of these. For this, awareness programmes should be conducted. There are many organisations opened to conduct awareness programmes against such bad effects of alcohol and drugs. NGO, INGO are working in this field. Different efforts have been made since 25/30 years to control it but still it is not under control. We should create environment not to use and make others use alcohol and drugs. Different parts of our country have been announced as alcohol prohibited zone. We should strictly bring this into practice.



Activity 1

Discuss in the group and fill in the blank relating with alcoholism and present it in the class.

S.No.	Name of alcohol	Learning way	Physical effect	Mental effect	Social effect
1.					
2.					
3.					
4.					
5.					

Alcohol and Drugs

Alcohol and drugs are two different intoxicating substances. Such substances weaken our body. We use different kinds of alcohol and drugs in rituals, ceremonies, parties according to our own customs and religion of different community. The use of such things not only damage physical strength but it also causes the loss of social prestige and economy too.

a. Alcoholism

Drinking of liquid like *Jaand*, *Tumba*, beer, raksi, rum, whisky and other brand of alcohol is known as alcoholism. These are also known as *madira*. In the beginning, people use alcohol by the imitation of friends or family member in feast, festival and rite. Later on it takes the form of habit. The use of these alcohols makes our body weak.



Especially such alcohol affects liver, heart and brain of a person. The brain of drunkard can not function well and such person may involve in immoral and illegal activities too.

b. Drugs

The chemical substance that makes weak by affecting brain when taken into the body is called drugs. Most of the drugs that are used directly come from ganja, bhang, poppy plants. Substances like hashish, heroine, etc. are made by various drugs. The use of drugs bring change in normal behaviour such as irritational thinking, dizziness, excitement, etc. of a person. Continuous use of drugs creates problems like unusual mentality, loss of sleep, problem in hearing, eye-sight and sensibility etc. Continuity of drugs may cause madness (mental disorder) and ultimately death may occur.

Physical Education

Activity 2

Write and demonstrate a play with the help of teacher on 'Against of Alcohol and Drugs'. Also invite your parents in demonstration programme.

Exercise 1

Tick (✓) the true and cross (✗) the false statement.

- Alcohol and drugs are intoxicating substances. ()
- The use of alcohol and drugs is good according to the tradition of family. ()
- Dhaturo lies in the group of alcohol. ()
- Alcohol has effects bad on the physical, mental and social aspect. ()
- To conduct the programme against alcohol and drugs is the responsibility of all the people. ()

Exercise 2

Answer the following questions.

- Write the name of any four substances that come under alcohol.
- What kind of suggestion will you provide to your family member to make him stop drinking alcohol? Write any two points.
- Write any two effects of alcohol.
- Write any three symptoms of drug abuser.
- What can you do to avoid the person who uses alcohol and drugs? Write any two points.

Health Message

Let's stop alcohol from today onward and make our life happy and peaceful.

Locomotor skills

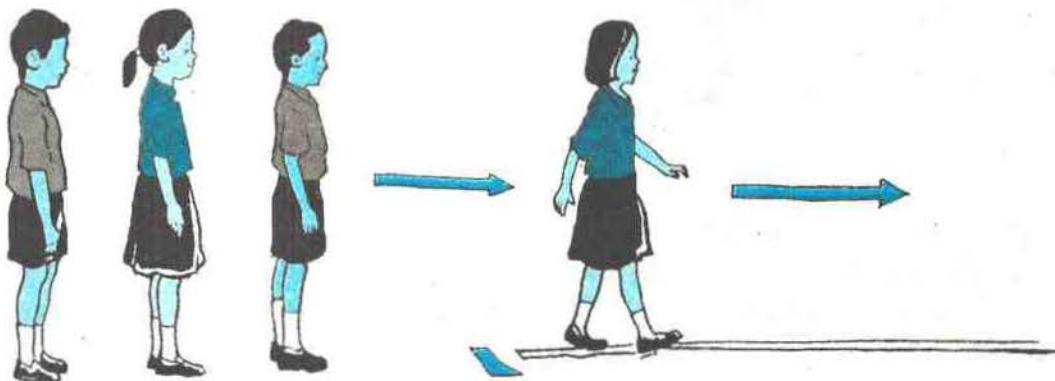
Walking, running, jumping and throwing, etc. are the mostly used action in our day-to-day life. If we do these actions regularly, we will be healthy, strong, active, wise, etc. Such various physical activities are known as locomotor skills. These are the basic skills of physical education.

Walking

If we walk in correct way, our health does not become worse. Walking by keeping legs apart, walking by paws, walking by joining legs cause difficulty in walking. While walking, we should walk first with heels and then forward slowly by paws. Body should be straight. Hands should be moved according to the movement of legs. Let's do various activities for proper walking.

Activity 1

Walk in a straight line.



Running

We can reach faster by running than walking. Hands and legs move faster in running. Breathing is faster. Running helps to make our health strong. There are variety of running. We should warm up our body before running. Then we should get ready to run.

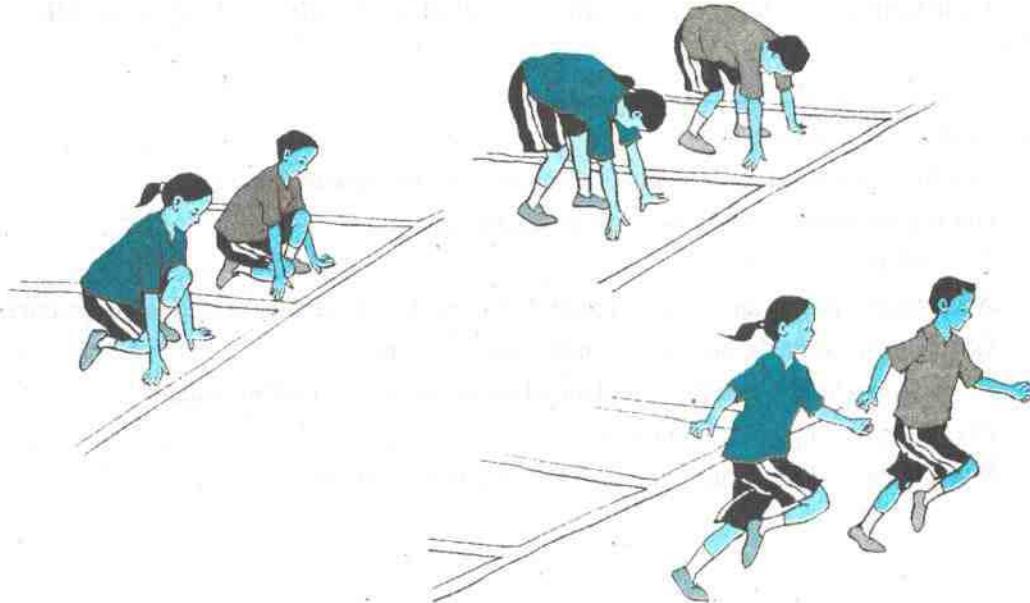
Runner should enter the track only after the participants are called for competition. Track is the way to run for the runner. Only one runner runs in a track. We should know rules of race before running. Short distance race, obstacle race, relay race, etc. are the types of race. Among these, we will practice here short distance race of 75 m.

75 m Race

Activity 1

Starting and commanding technique of running

Make the group of 5-5 students and stand behind the line. Run in ‘on your mark’, ‘set’, and ‘go’ turn by turn. Similarly give command to your friends in loud voice to run.



Activity 2

Walk in a circle fast and complete the one round walking.



Come in a file!

Activity 3

Walk fast in curve line and return in straight line.



Look, learn and practice

1. Make a file of two students and march in a line.
2. Make a file of three students and march in a line.
3. Who is first after walking in a file.
4. Cover the distance of 30m. by walking in different ways.

Jumping

Lifting the body in the air by leaving the ground is known as jumping. We can move forward, backward, left, right by jumping. We need the skill of jumping to cross the river and to cross the obstacle in road, etc. There are many types of jumping.

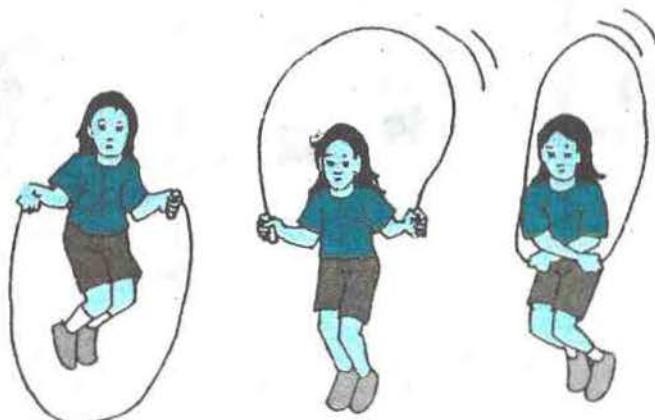
Long jump is a very pleasant game. Long jump may be done by running or standing. We should step in take-off board while jumping. Take-off is kept in the end point of run. After take-off we should fly in air and land on ground.

High jump is also pleasant athletics. A cross bar is put for high jump. It falls down easily if any part of body touches. The area which is fixed to land after flight is called landing area. The landing area should be soft. Let's do different activities for practice for long jump and high jump.

Activity 1

Skippping

Join the legs. Hold the grip spaces of skipping and move the skipping from forward to skip. Repeat the practice as many times as you can.



Activity 2

Obstacle or hurdle race

As given in the figure practise hurdle race by making different obstacles.



Look, learn and practice.

1. Practise to go up and down in a nearby ladder.
2. Decide who will hold first position in 75 m race.
3. Command the friend to run. Similarly change the turn and run yourself.

Teaching Instructions

- Get all the required equipments like ball, white lime powder, tape etc.
- Get the students warm up before starting the activity.
- Do activity in sequence.
- After demonstration and explanation given by teacher encourage the students to practice.
- Obstacles in obstacle race should not cause accident.
- Be aware about the possible accident while getting on and off in ladder.
- Pay attention to pleasure and time.
- Make them to do practice activity according to weightage.

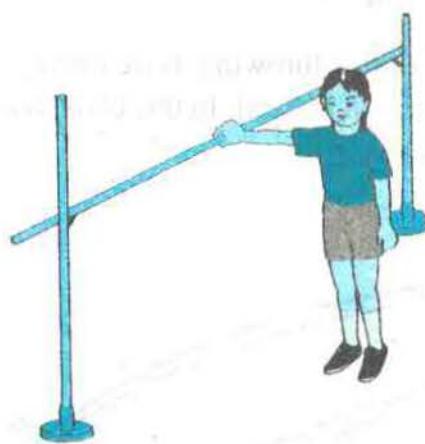
Activity 4

Jump on increased height

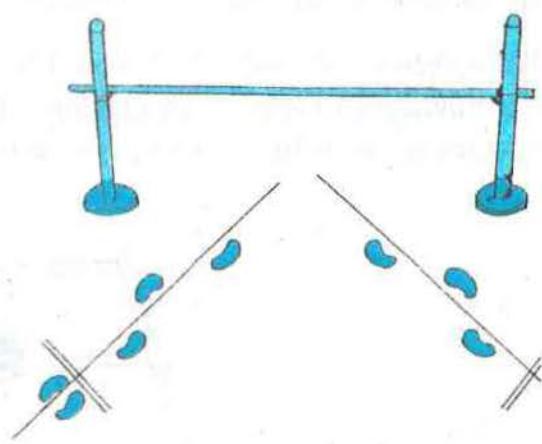
We can practice high jump at different height. After crossing of every height, we should increase 1 cm height and jump.

Figure's instruction

Jump by increasing height



General distance to start jump



Look, learn and practice

1. Start jogging one round in a field. Then 'squatting' with the difference of 10 m and jump over each student.
2. Make the height of 30 cm near land area and practice the landing.
3. Practice the long jump by standing at a place and measure how far you can jump.

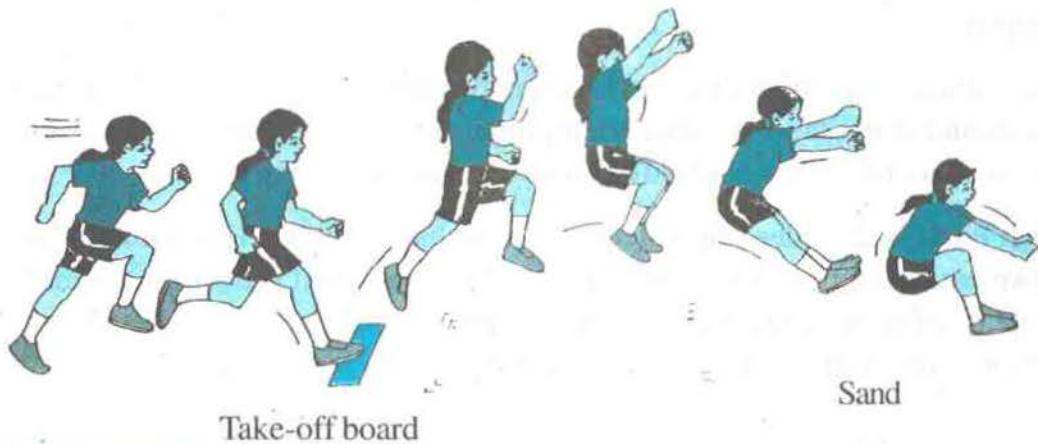
Teaching Instructions

- Activities should be done only after warming up.
- Get all the materials for skipping in time.
- Apply the methods of 'look and learn' to unskilled students.
- Observe the landing area and make them aware of possible accident.
- Never forget to appreciate their right activities.

Activity 2

Long Jump

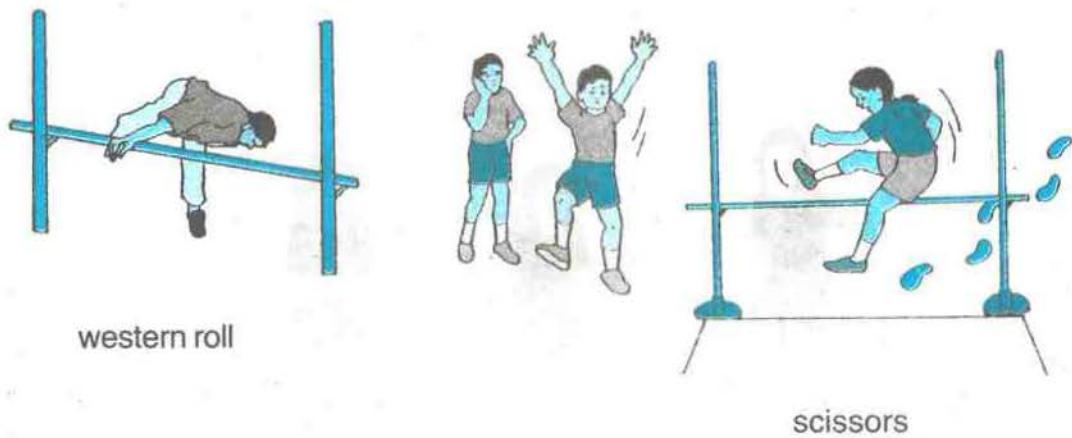
Stand in a line. After calling the name, run in runway. Step in take-off board and practice long jump.



Activity 3

Different style of high jump

Let's practice different styles of high jump by standing in a line. Help your friends to learn the skills of jumping. Do activities according to the learnt skill.



Activity 1

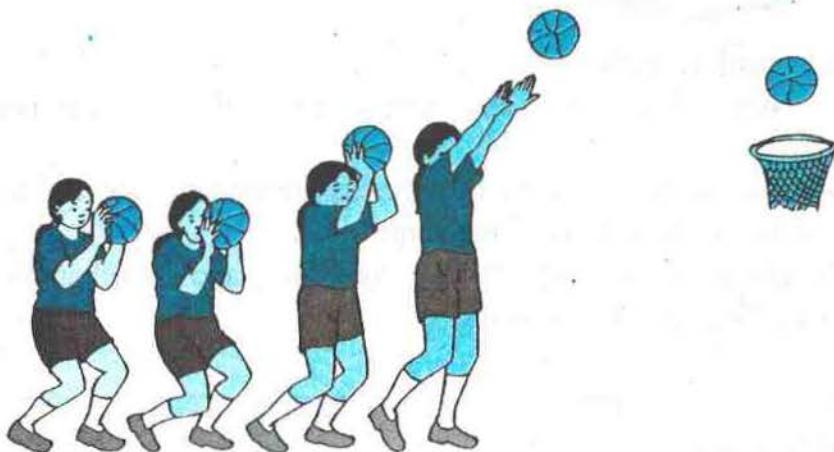
Game hitting with chungi or ball

Make a group of 10-15 students and border the fix area and then play a game hitting with chungi.



Activity 2

Throwing the ball in basket.

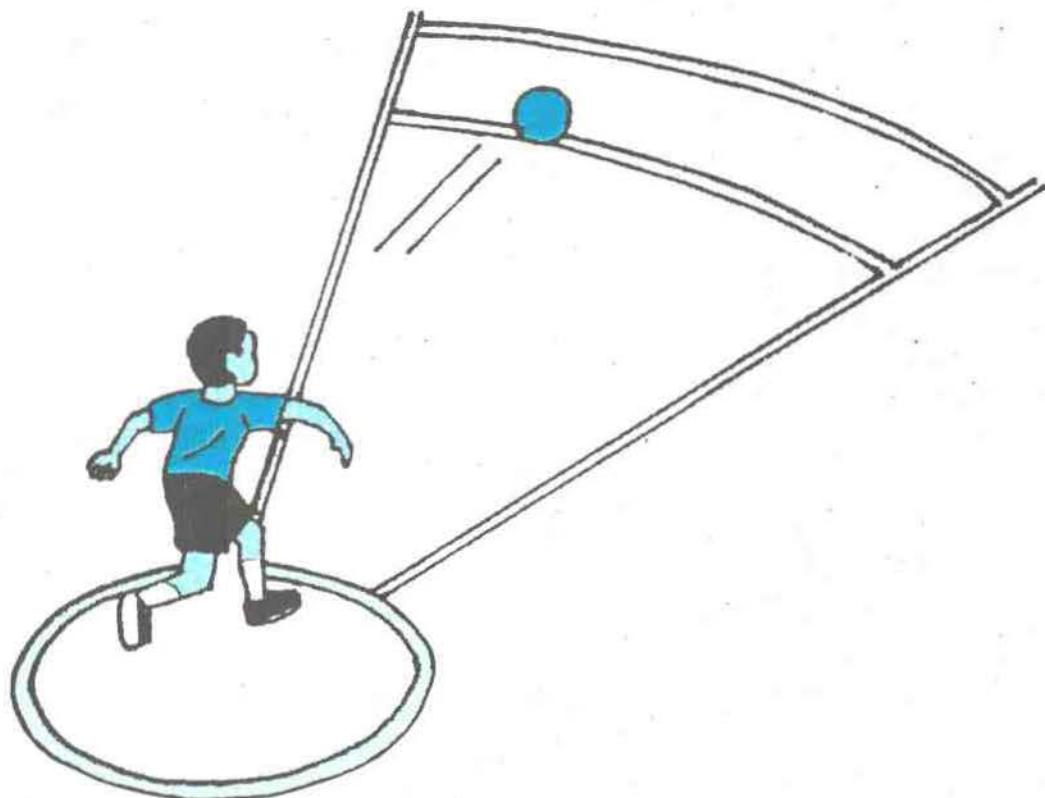


Make a line according to the number of students. After that throw the ball in the basket and go back.

Throwing

To throw any object far is known as throwing. Throwing is a frequently used skill in daily life. There are more activities of hands in throwing. By throwing light and heavy object, throwing skill is developed. Some of the examples of throwing are throwing T.T.ball, shot put, stone or chungi etc. Games related with throwing are basket ball, hand ball, javelin throw, cricket, disk, etc.

We have to do different activities to develop the skill of throwing. If we manage the movement of legs, hands and body, throwing will be well. In this class, we practice the throwing of small, light and heavy ball.

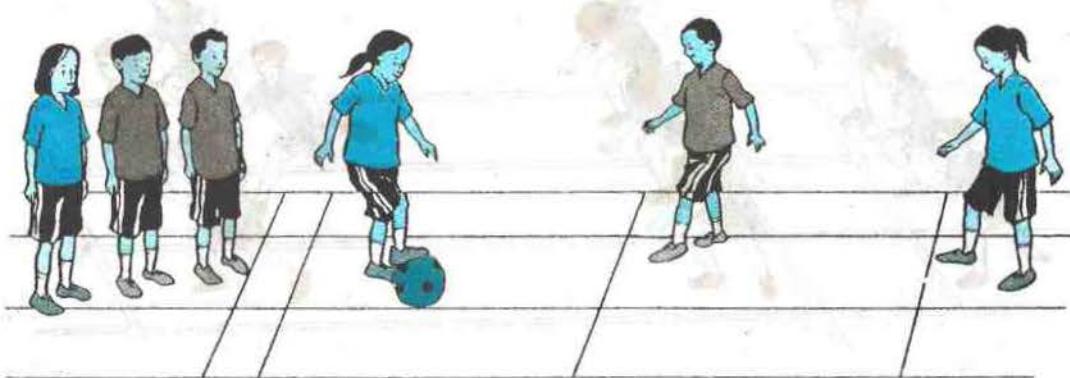


Relays

Games that are played by making groups are relays! These are very enjoyable when played by helping each other. Relays can be played with materials or without any materials. We use open field for relays.

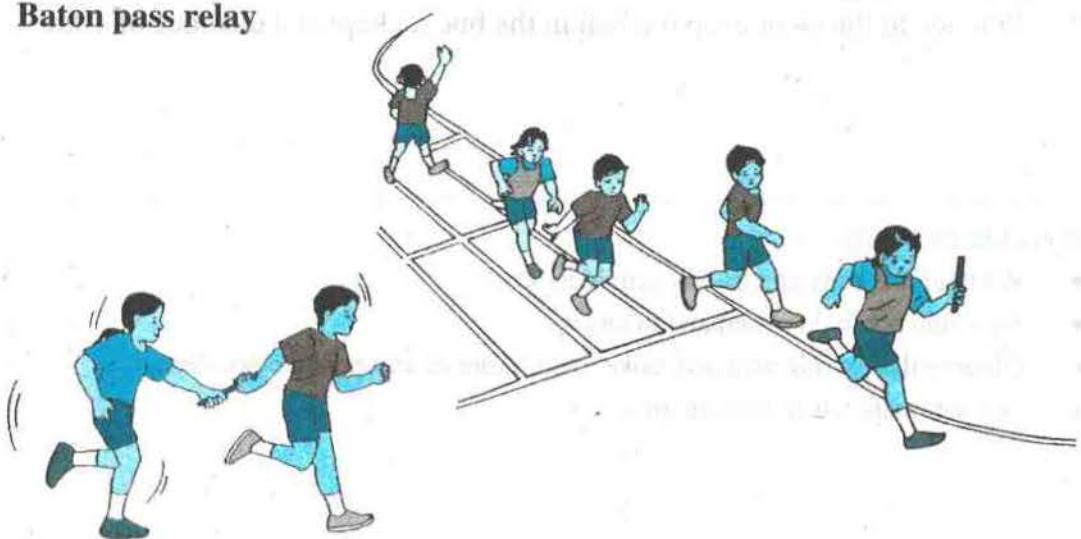
Activity 1

Ball pass and target relay



Activity 2

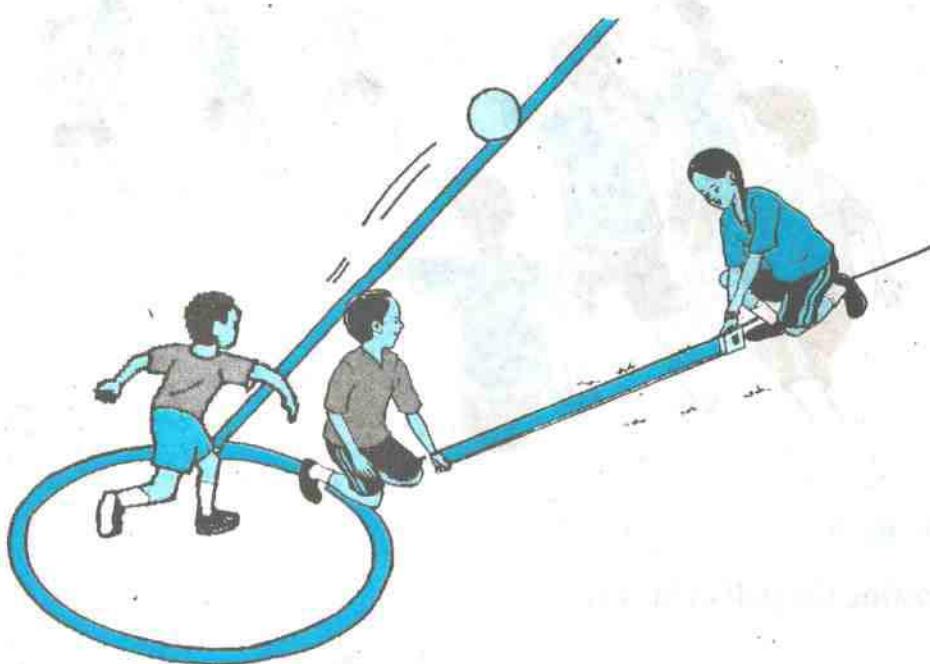
Baton pass relay



Activity 3

Throwing heavy ball from within the circle

We follow the rule of shot put in this activity. Throw the heavy ball as far as we can. Ask your friend to measure the distance by tape.



Look, learn and practice

1. Make a group of two students and pass the ball by sit up from one person to another.
2. Throw the ball as far as you can from fixed point and measure the distance. Who can throw long distance? Find out.
3. Do skipping 10m, run nearly 10m for long jump and after that return the tennis ball lying there by throwing.

Teaching Instructions

- Teacher or skilled students should demonstrate the game and do activities.
- Volley ball, foot ball, basket ball can be used as a large ball, cricket ball as heavy ball and T.T. ball can be used as light ball for throwing. Besides these, locally available materials can be also used.
- Make free or open space in the direction in which heavy ball is to be thrown.

Let's save from accident

Accidents may occur while playing, walking, working in the field and factories, climbing trees, in journeys, crossing road due to carelessness. Accidents causes wound, breaking of the teeth, hurt in the eye and fracture of parts of body. Such accidents may occur due to ignorance and carelessness of human beings. But some time natural calamities also cause accidents like earthquake, fire, storm, flood, landslide, etc. Such calamities also cause loss of life and property.

Prevention from such accident is a safety. Working with safety, we can protect from accident. To be careful and alert to protect ourselves from accident is safety. There is less possibility of accident while adopting the measures of safety in a work.

While crossing the road, road signal and traffic rule must be followed. We should walk carefully in steep land and crossing the river. Medicine and poisons must not be touched. We should be careful while crossing road, handling fire, swimming and using sharp tools.



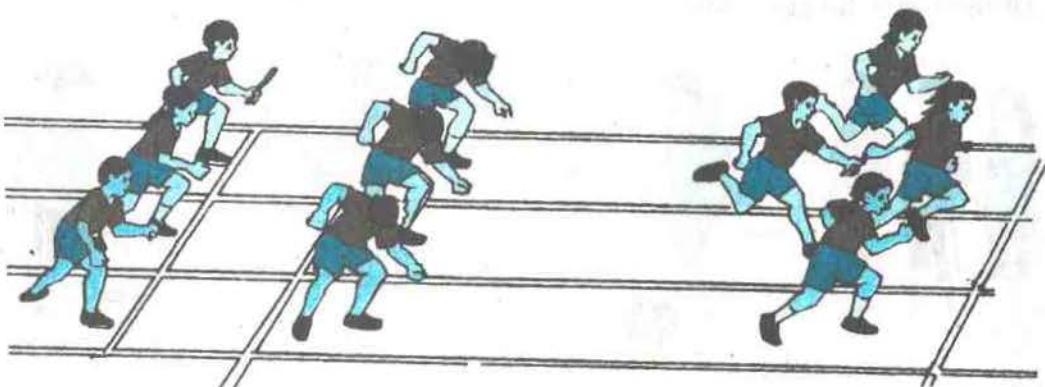
Activity 1

Draw or collect the various examples of accidents and paste in the classroom.

Activity 3

Hup and chungi pass relay

We can play the relays in different way. We have to do three activities in hup and chungi pass relay. Make the four groups by equal number of students and stand in the initial line. When the game starts, cover the distance of five metres by hupping and then again cover the distance of 10m by single log hupping. Pass the chungi of hand to friend after reaching the end line. Similarly others should repeat the same process. At the end, find out which group is first? Congratulate the winner team.



Look, learn and practice

1. Play the baton relay by making four groups.
2. Play chungi game in a circle and congratulate the winner by clapping.
3. Practice to throw or drop the ball in the bucket kept at a distance of 10m.

Teaching Instructions

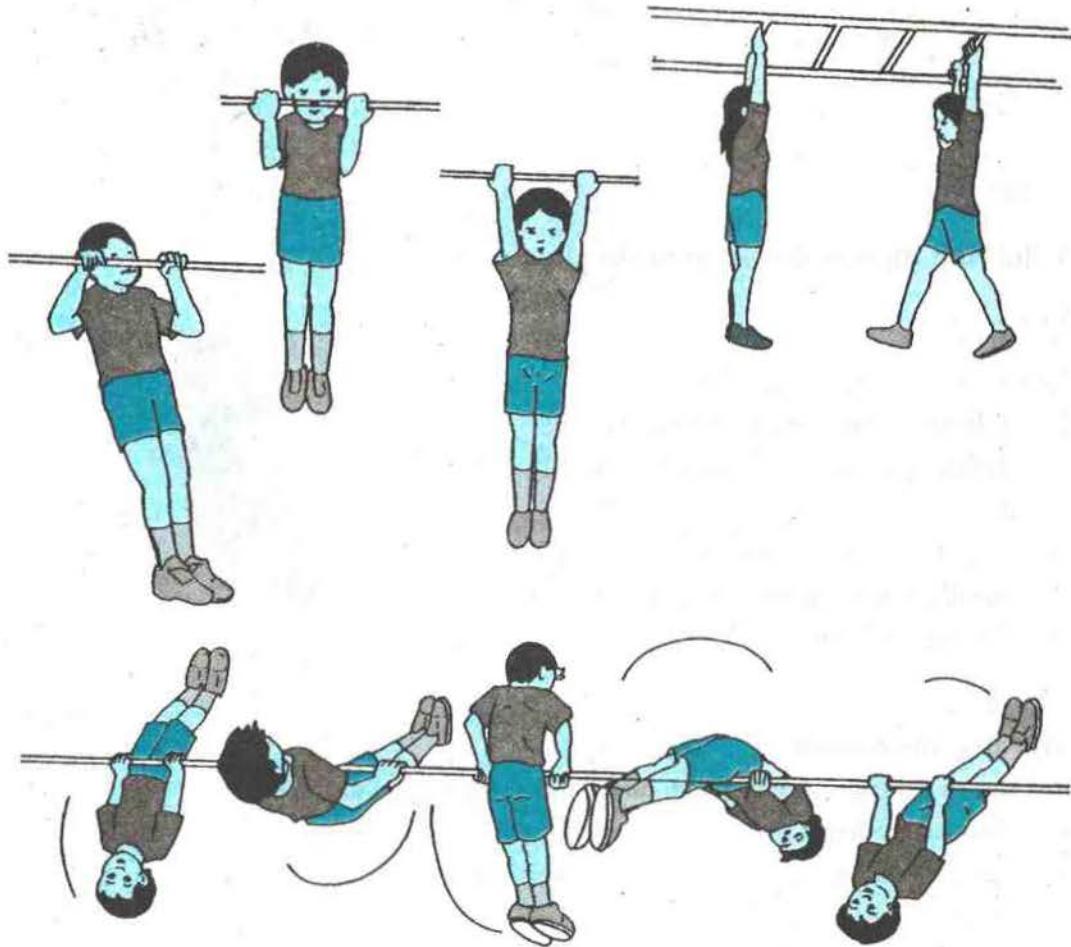
- Warm up the body and do any activities.
- Set a rule not to do underhand in target.
- Observe the playing area and make them aware of any possible accidents.
- Use soft materials in landing area.

Non-locomotor skills

Physical activities which can be done without changing the place are known as non-locomotor skills. These activities can also be done by standing, sitting, and laying. Pulling, pushing, throwing, stretching, etc. are non-locomotor skills. These activities help us to do various work in our daily life. Therefore, we will do following activities to develop the non-locomotor skills.

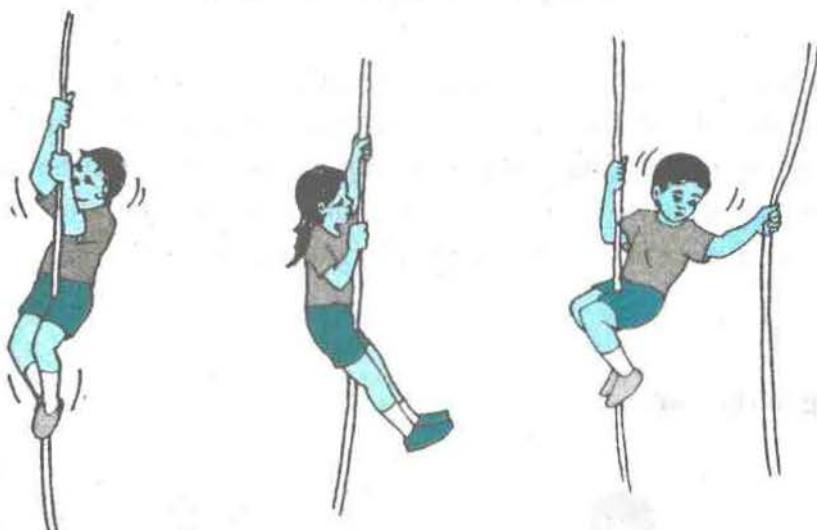
Activity 1

Hanging in the bar.



Activity 2

Climbing on vertical rope.



Activity 3

Climbing up and down on vertical pole.

Look, learn and practice

1. Climbing on vertical pole and move from one side to another side of bar.
2. Try to move from one place to another by hanging on the rope.
3. Swing on the bar.



Teaching Instructions

- Instruct them to climb up and down in the observation of someone.
- Encourage them.
- Observe the playing area and aware them about possible accident.
- Warm up at first and let them participate.

Drill

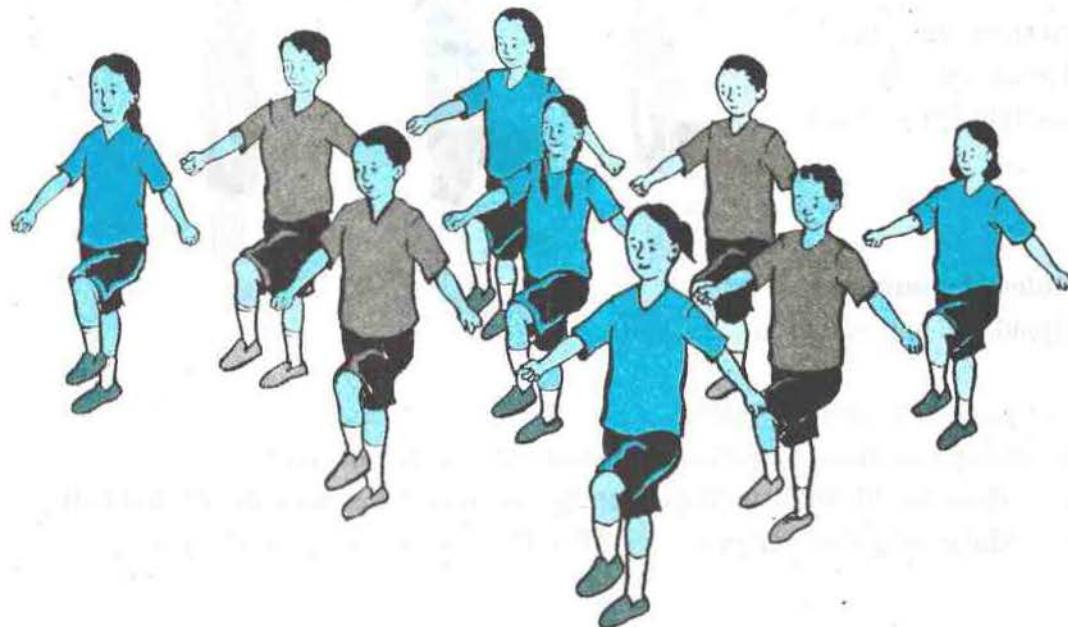
The physical activities performed repeatedly in a group according to the command of group leader is called drill. Different activities are done in drill. A program will become attractive if drill is performed.

We should perform drill in rows or lines. Stand at ease, attention, stand easy (rest), etc. activities are done regularly. Drill starts from attention. Here, we will practice the activities of mark time, quick march, halt etc.

Activity 1

Mark Time

At the command of mark time attention position, we should move left leg by counting 1 and the right leg by counting 2.



Activity 2

Quick march

At the command of quick march the squad move forward quickly in a file by counting 1 to move left leg forward and right arm toward and 2 to move the right leg and left hand.



Rules of command

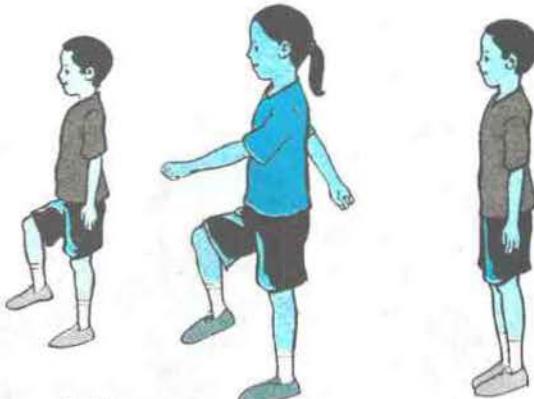
1. The squad should move quick march (information)
2. Quick march (command)
3. Moving of squad quickly (activity)

Activity 3

Halt

Halt command should be given when the squad rest their left legs on the ground. We do halt practice by following the given rules.

- To right leg - check
To left leg - 1
To right leg - 2 (halt)



Rules of command

Squad will halt, squad halt.

Look, learn and practice

1. Give command to the friend of halt and practice the halt.
2. Make the file of 3 students in each. Command the quick march and halt.
3. Make the group and practice drill and command the group to halt.

Exercise 1

Answer the following questions.

1. Which organs of body moves while doing drill?
2. What are the position of left and right legs in halt command?

Teaching Instructions

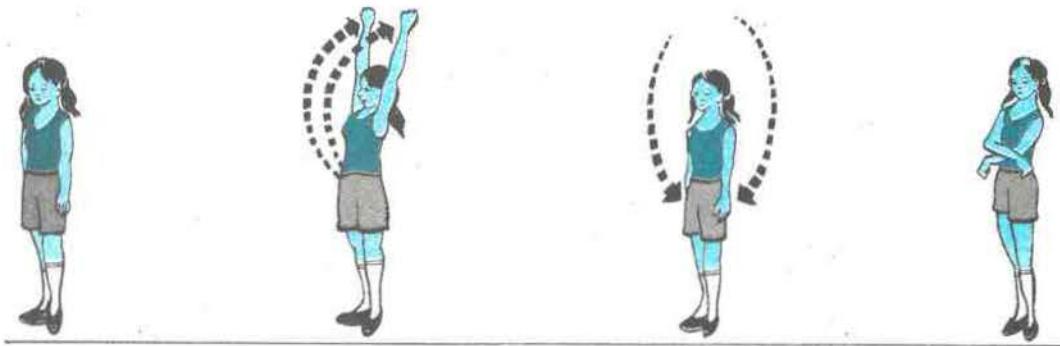
- Focus various activities for warm up.
- Give the clear concept of row and file.
- Make your sound loud and clear.
- Encourage them to remain in discipline.

Physical Training (P.T.)

Physical Training makes us healthy, strong, active and develops the traits of discipline. Therefore, we do physical training in a group. We can prepare and practice group of students in physical training for making the demonstration interesting in a school function. In class 4, we have done the activities of 1 to 13. Now, let's do physical exercise in the tune of song or drumset.

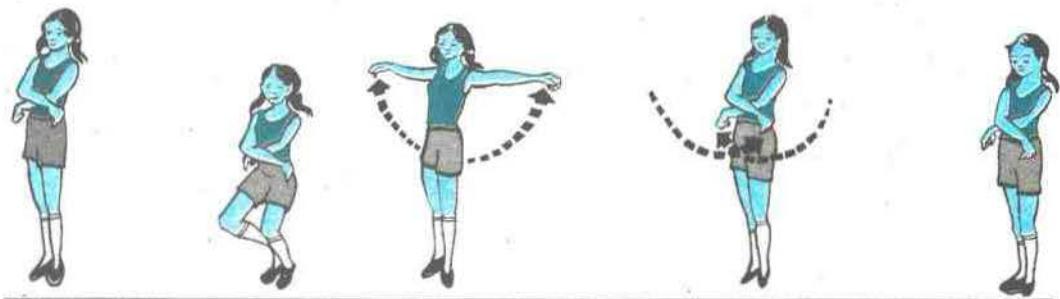
Activity 1

P.T.of stretching the body.



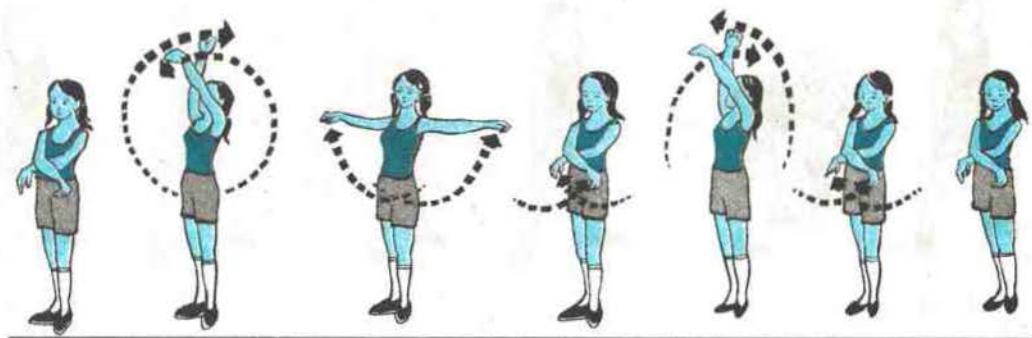
Activity 2

P.T. of hands and legs.



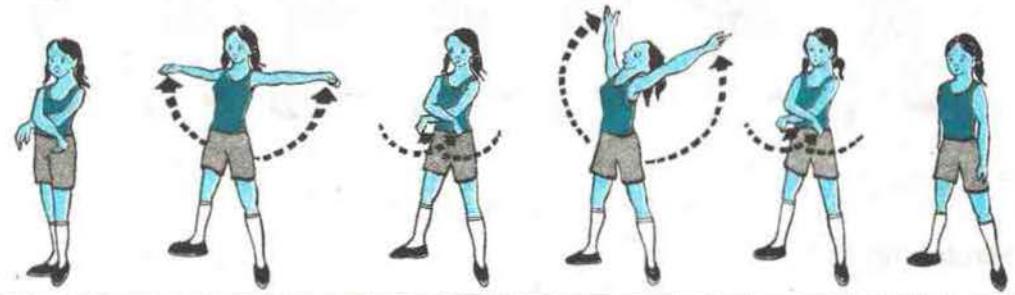
Activity 3

P.T. of shoulders.



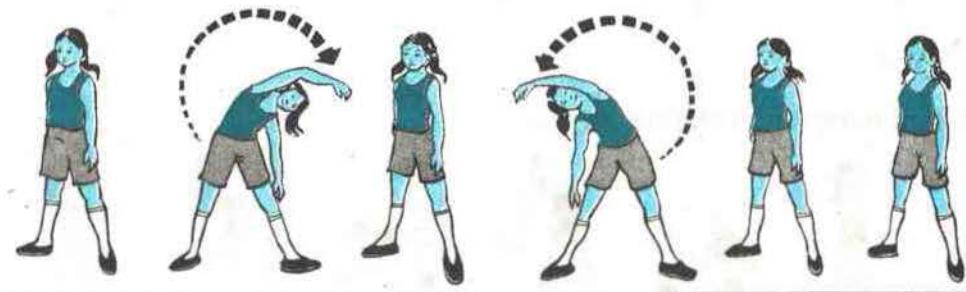
Activity 4

P.T. of extending the chest.



Activity 5

P.T. of hands and waist.



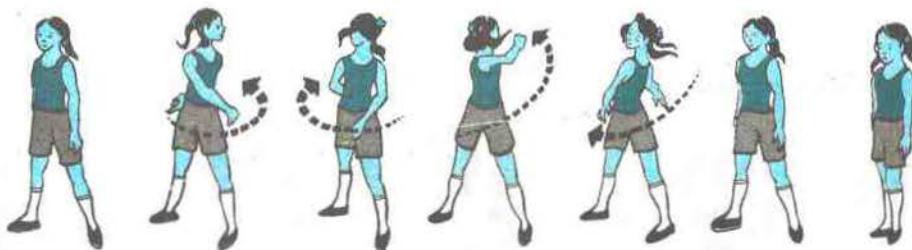
Activity 6

P.T. of backbone and waist.



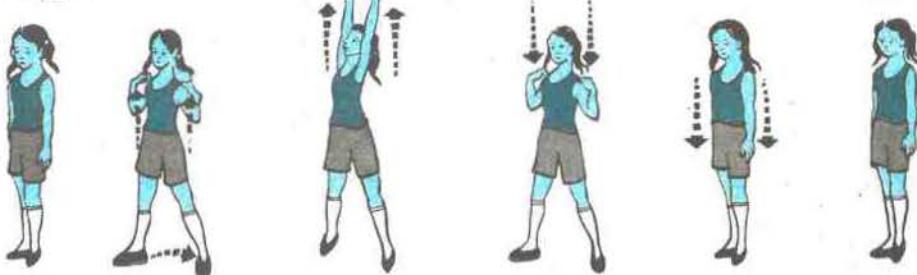
Activity 7

P.T. from feet.



Activity 8

Stretching P.T.



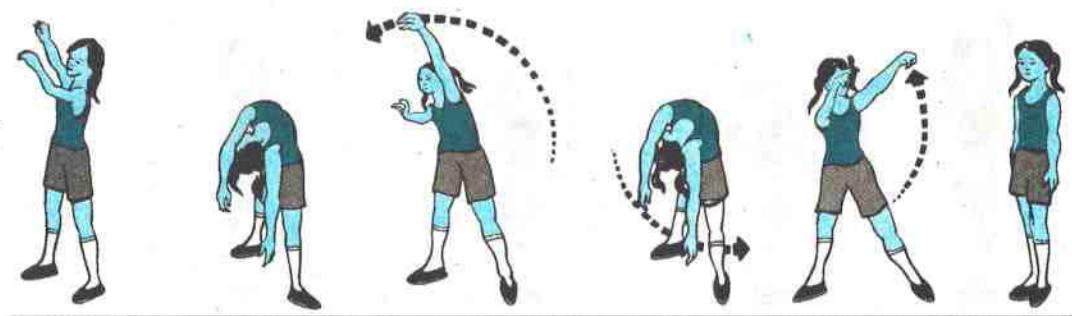
Activity 9

P.T. of bending of the waist.



Activity 10

P.T. of circling the body.



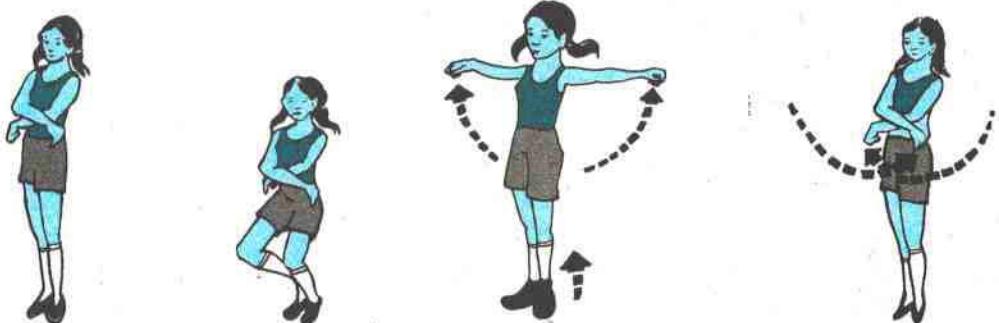
Activity 11

P.T. of bending the body.



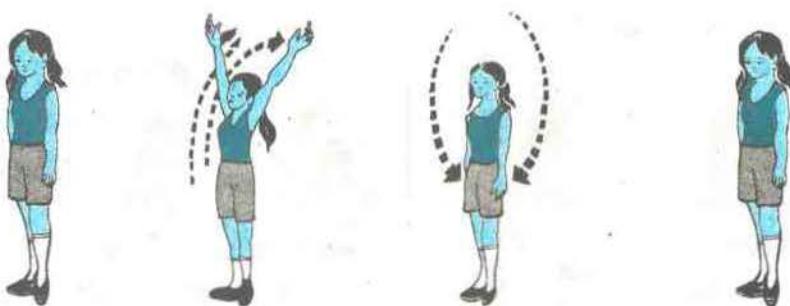
Activity 12

P.T. of respiration and body.



Activity 13

P.T. of respiration and body cooling.



Look, learn and practice.

1. Practice the physical training alone or with friends.
2. Practice P.T. in a group with the tune of music.

Teaching Instructions

- Observe whether the students are doing P.T. in right way or not.
- Pay attention to see whether the students are doing P.T. in right way or not with the turn of music.

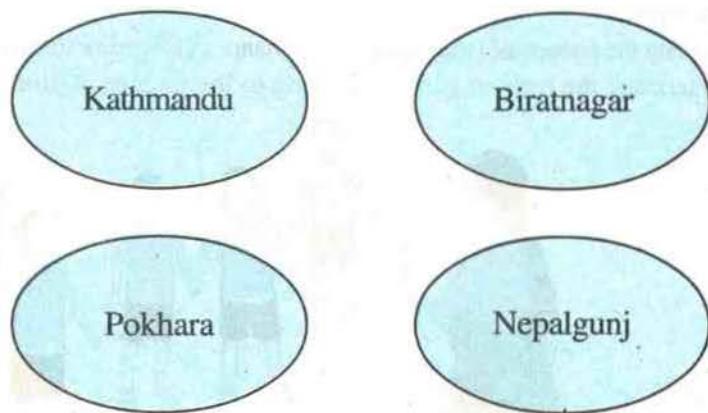
Minor or Local games

Minor games

We play different games with friends by running, chasing, jumping, touching and catching. These basic activities help to play major games. Free city, fisher man, be in number, etc. are the minor games. The games which help to play major games are called minor games. Less materials and simple rules require to play these games. There is no fix number of players, measurement of play ground is also not fixed. We can play these games in a circle and in fixed border easily. These games are called minor because these can be played easily everywhere and any time. Now, we play some minor games according to the figure given below.

Free city

Activity 1



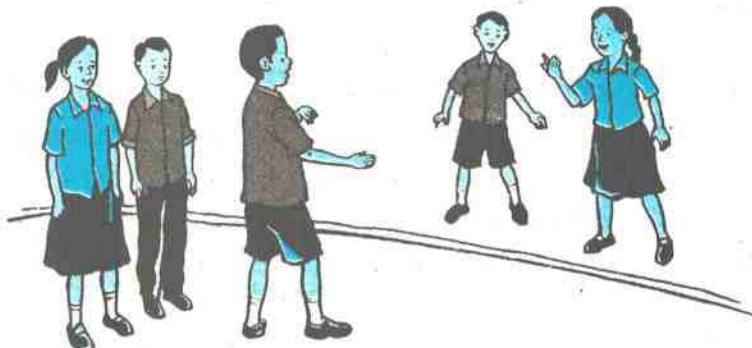
Teaching Instructions

- Warm up before playing the game.
- Apply safety measures.
- Determine the number of cities according to the number of students and size of play ground.
- Try to make game interesting by making loud sound to take the name of cities.
- Choose new leader of the court whose court is touched while entering the court pronounced by teacher.
- Determine the time based on situation.

Activity 2

Fisherman

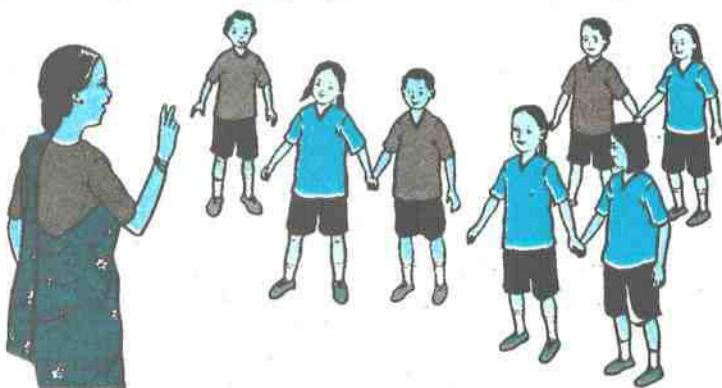
Let's practice the game fisherman as given below.



Teaching Instructions

- Determine the area to play game by using bags, shoes and lime powder.
- Observe whether they are crossing the river as acting fisherman or not.
- Those will be the friends of fisherman who are touched by fisherman while crossing the river.
- Among the friends of fisherman give a chance of only one student to perform in an action.
- Determine the time of game according to the interest of students.

Activity 3



Be in the number

Play as shown in the figure. Run within the boundary line and play by making numbers as told by the teacher.

Teaching Instructions

- Draw a line according to the number of students and order them to run outside the line.
- Say the number clearly and keep the student outside who can not make a group as the number.
- Tell them to hold hands while forming groups according to the number and avoid the others.

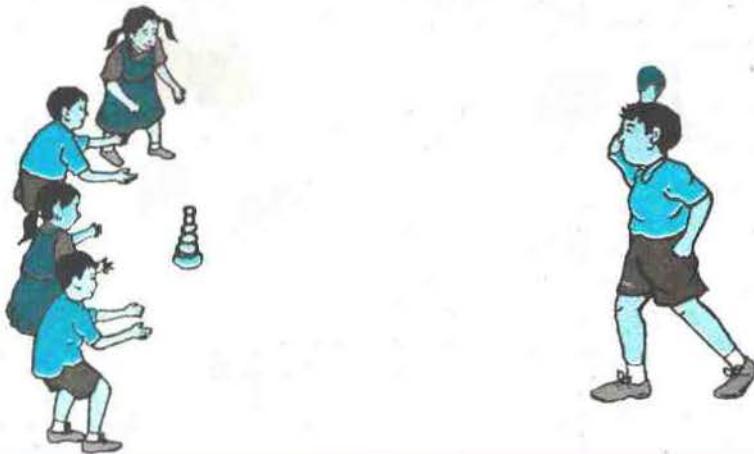
Local Game

Local game is a game that is organized and played locally. Such games are played in our villages from ancient times. These games have not any particular rules. They are played in accordance with our geographical structure, religion, culture, caste, living style and climate. Games that are played in local level in our own way are called local games. *Ghwainkasa, Lakku Dhalne, Gatta khelne, Dandibiyo, Telkasha*, etc. are local games.

Activity 1

Lakku Dhalne

Now we play Lakku Dhalne game between two groups as given in the picture.



Teaching Instructions

- Divide the students in two equal groups and determine distance of ‘Lakku Dhalne’.
- Give a turn to next group if first group fails to strike “Lakku”.
- Confirm the boundary according to the necessity.
- Keep the group out of boundary line if the group of ‘Lakku Dhalne’ hit the ball to ‘Lakku Thadyaune’.
- Don’t forget to thank and to provide number to the group which is successful to “Lakku Thadyaune” according to the rules.
- Use stopwatch to findout which group is successful to complete ‘Lakku Thadyaune’ or to send the opposition out of boundary.

Activity 3

Dandibiyo

The game which is played striking a 45cm stick (Dandi) to a small stick (Biyo) of 15 cm is known as Dandibiyo. Let's practice Dandibiyo by observing the pictures below.



Teaching Instructions

- Fix the boundary line. Be careful to the accident that may occur by Biyo during the play.
- Divide students in two groups and record scores of each group that is scored by stricking Biyo by Dandi.
- Encourage the students to play the collected new local games.

Creative Games

(A) Story Game

A storey game is a game that is played on the basis of story. As these games are based on story, they are more interesting. We can play the following story games according to our interest.

Activity 1

To enact according to the story of jackal and grapes.

Activity 2

To enact the game based on the story of lion and hare.

(B) Games of Imitation

We enjoy games to play by imitating the roles of various animals and birds. Likewise, we enjoy playing roles of various social personalities. Such activities would add healthy entertainment to us. Likewise, the development of physical, mental, creative skill and habit of imitation would also increase.

Activity 1

Duck walking

Walk like duck squatting and keeping both hands behind. Sometimes quack like "kwan ... kwan" and shake tail.

Activity 2

Duck's walk in pair

Cover distance walking like ducks in pairs together.

Activity 3

Crab crawling

Hold the body up keeping your hands behind and shrinking knees and crawl in front like a crab with the help of hands and legs.

Activity 4

Frog jump

Squat keeping both of your hands on your waist and keep on jumping in front with your both legs at once as far as practicable.

Activity 5

Elephant walk

Hold your nose with your thumb and index finger of your left hand and walk like an elephant making a trunk inserting right hand below left hand.

Teaching Instructions

- Make them warm up to do general exercise. Make proper environment and things for enactment(acting).
- Provide opportunity for acting to all students.
- Create stories according to the situation and make students act accordingly.
- Teacher should show each activities to the students.
- Hold discussion related to the pictures and inspire them for imitation.
- Make them act separately in individual, pairs or groups.
- Make all the students act as far as possible.
- Increase or decrease the walking distance according to the capacity.

Ball games

Ball games are very interesting games for us. In these games many friends can participate at a time. These games can be played by hands and feet. Passing the ball, dribbling, servicing, etc. are some of the basic skills of ball games.

Activity 1

Dribbling the ball

Dribbling is an act of moving forward the ball with instep, outstep, insidestep and to dodge the opponent. Now practice the dribbling as shown in figure.



Dribbling in the circle

Dribbling in a circle

The process of hitting the ball on the ground with the help of hand and moving forward is called bouncing. Make English digit '8' by bouncing as shown in the figure.

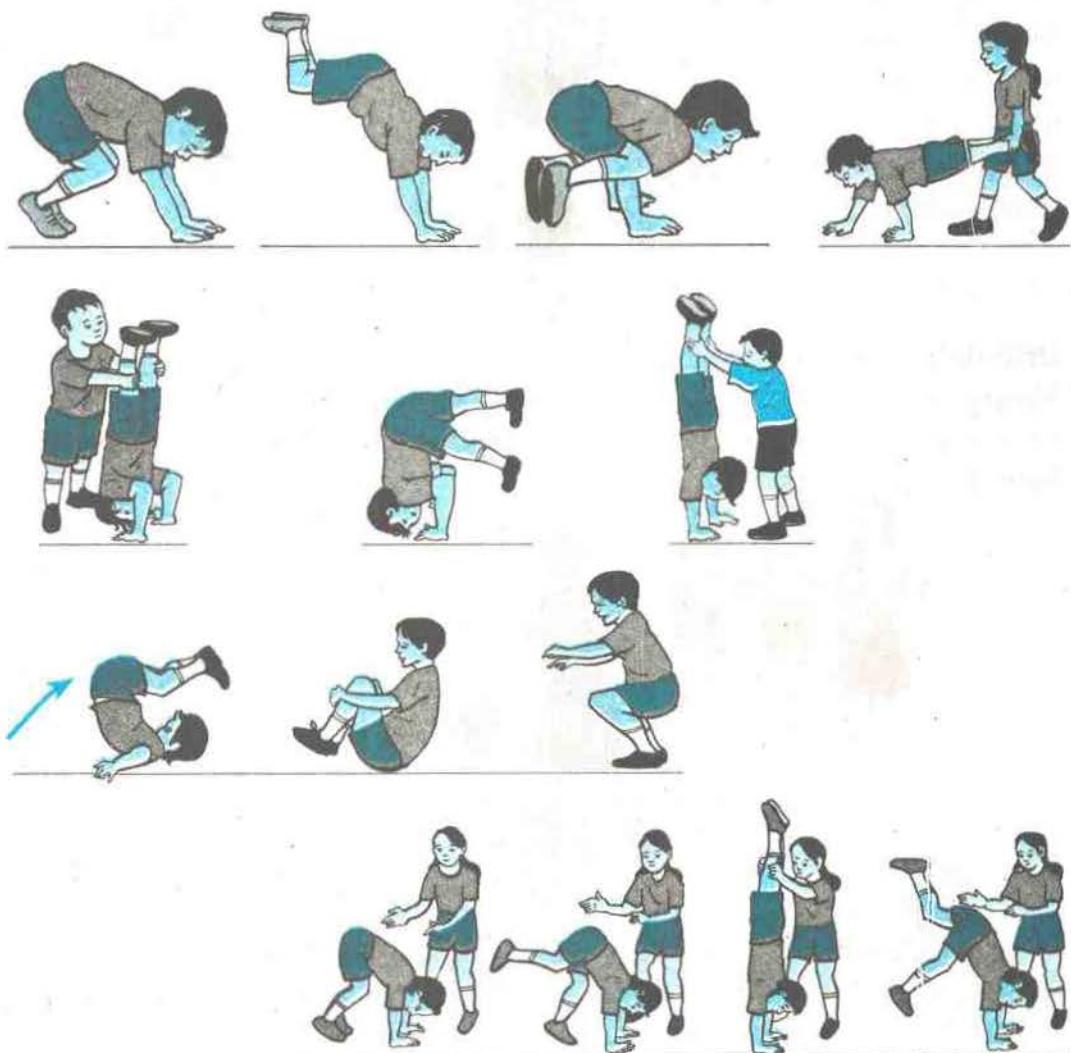


Teaching Instructions

- Divide the students in groups according to the number of available ball.
- Besides the figure above, encourage them to practice of dribbling and bouncing in different organization for pleasure.
- While dribbling the ball, practice to dribble by the insideside of toe to heel.

Balance Work

We should be able to balance our body by ourselves. It may be easy to balance by standing with two feet or sitting. Besides these, we can balance our body by various ways. Raising the body according to the desire is balance work. In previous class, we have learnt some balance work such as walking on hand, standing on head, standing on single foot, etc. Now, in this class, we will practice the balance work by making different shapes.



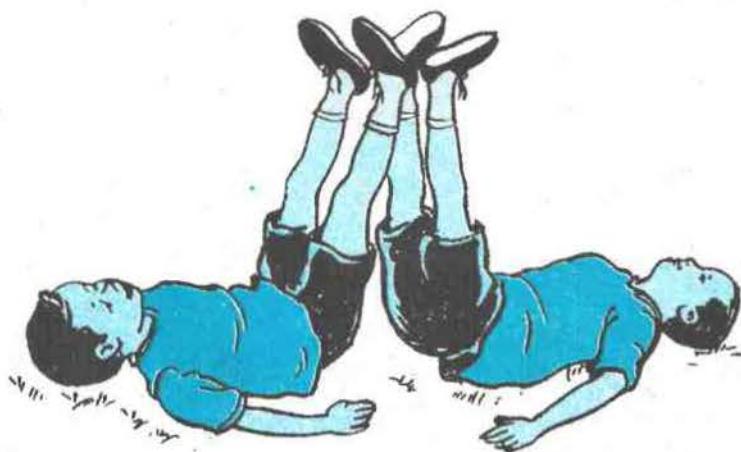
Activity 1

Balance by standing on bending trunk of two persons with stretching hands.



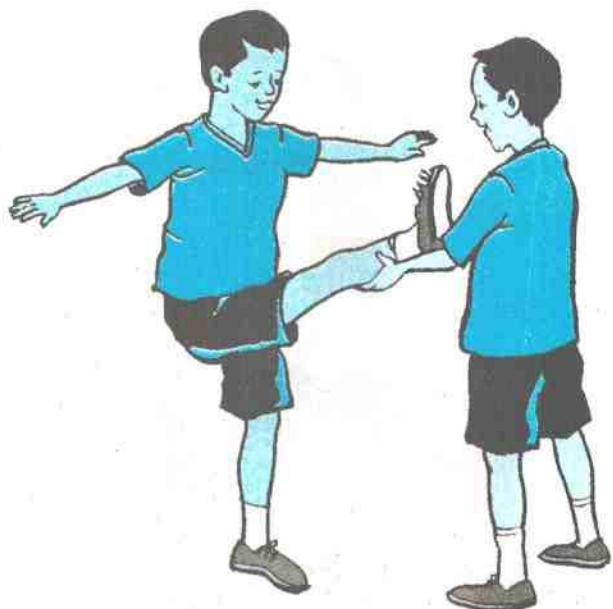
Activity 2

Raising legs by standing on shoulders.



Activity 3

Balance of two persons by stretching leg.



Look, learn and practice.

1. Perform balance work in single.
2. Perform balance work in pair.
3. Perform balance work in group.

Teaching Instructions

- Encourage the students to activate.
- Observe the play ground and make them aware of accident.
- Warm up before any activities.
- Be careful and command carefully.

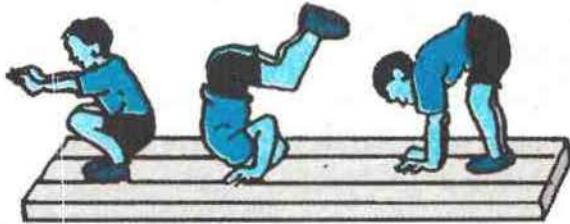
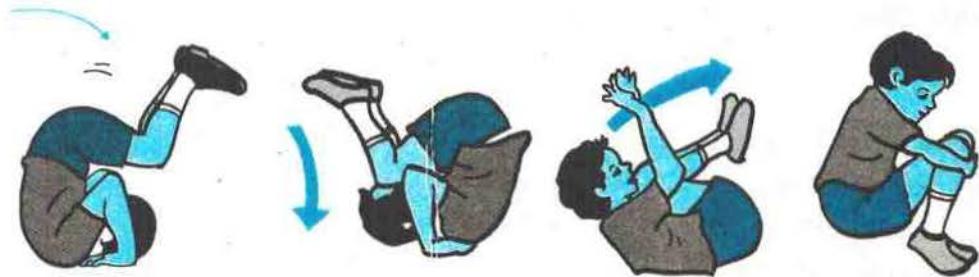
Tumbling work

Gymnastic is an important sport. It is the skill to balance the body by various activities by using or without using any materials by players.

The rolling of body forward and backward in safe way is tumbling work. Such activities help us to protect us from injuries. In this class, we learn various rolls activities done with shoulders.

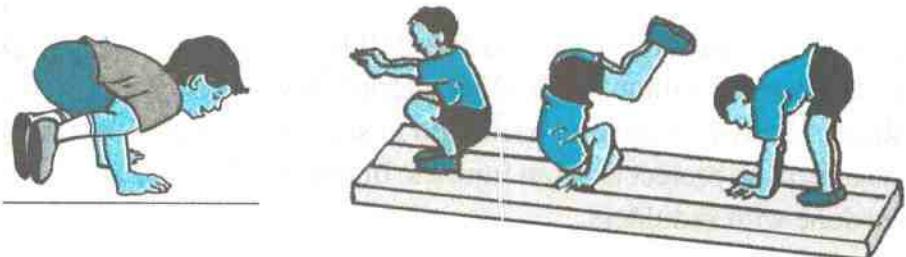
Activity 1

Front roll



Activity 2

Back roll



Activity 3

Side roll

Look, learn and practice

1. Do tumbling work with the help of friend.
2. Do front roll, back roll and side roll in pair.
3. Do tumbling work in group.

Teaching Instructions

- Encourage the students to participate.
- Observe the playing condition of students.
- At first do less tumbling work.
- Observe and make them aware of possible accidents.
- There should be position of 8 seconds.
- Make them to balance on hand, legs and side.
- Make them stand on hand.