My Science, Health and Physical Education

Grade 5

Government of Nepal
Ministry of Education
Curriculum Development Centre

Publisher: Government of Nepal
Ministry of Education
Curriculum Development Center

ISBN: 978-9937-8247-3-6

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First edition : 2052 BS

Reprint : 2075 Bs

Price: 83/-

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Preface

Continuity on the process of development and updating of curriculum and textbooks has been given so as to make school level education objective oriented, practical, contemporary and employment oriented. Fostering the feelings of unity towards the nation & nationality, developing attributes like morality, discipline, self-reliance, promoting fundamental language related and mathematical skills through the basic knowledge of science, environment and health-related issues. Education should instill life skills, create interest in art and beauty promote tolerance among different ethnicities, gender, religion, language, culture. Likewise it should make learners responsible citizen who can safeguard social values and norms. To fulfill this need this textbook has been revised and developed based on the curriculum 2065 which was updated according to the suggestions of various level committees, teachers, guardians and the final decisions of seminars and interactions including other stakeholders of education.

This book includes three areas: Science and Environment, Health and Physical Education. Illustrations, contents and activities to be learnt by self exploration have been given so as to make it activity oriented and learner centered. Instructions for teachers are also provided wherever possible. This book first written by Durga Regmi and edited by Mohan Gopal Nyachho in 2052 B.S. has been revised in line with primary curriculum by a panel comprised of Chitra Prasad Devkota, Ram Prasad Subedi, Dumberdhoj Angdembe, Achala Thapa, Nandakaji Shrestha, Nanubaba Dawadi, Imanarayan Shrestha and Maniraj Poudel. This Edition was piloted before its implementation. Again in 2065 B.S. it has been revised in this form by a panel comprised of Dinesh Kumar Shrestha, Ram Prasad Subedi, Dumberdhoj Angdembe, Tilak Shashank and Shankar Poudel. The contents of science portion was edited by Ram Prasad Subedi. The health and physical portion was written by Shanta Bahadur Shrestha, Chandrabardhan Rai, Devraj Maharjan, Khagendra Bahadur Singh, Punnya Ghimire and Prakash Maharjan, has been edited by Nepal Hari Ranabhat, Om Raimajhi and Diwakarlal Amatya. The executive director Haribol Khanal and Dy director Shambhu Prasad Dahal have also played important role in developing this book. This book was translated by Shankar Adhikari and its language was edited by Ramesh Dhakal. Art editing and layout concept of this book was done by Shreehari Shrestha by making it four colour. CDC would like to thank all those who contributed in developing this book.

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Part 1 Science

Lesson 1

Different Kinds of Animals

Animals are of different kinds. One kind of animal is different from another on the basis of shape, size and physical structure. Animals around us can be divided into two types on the basis of their physical structure. Some animals have backbone whereas some others do not have backbone. Fish, frog, snake, crocodile, pigeon, chicken, cow, buffalo, dog, etc. are the examples of animals with backbone. Slug, earthworm, butterfly, grasshopper, spider, etc. are the animals without backbone.

Animals with backbone

There are many animals around us with backbone. Some of them live in water, whereas some others live both in water and on land. Some live only on land. These animals do not have similar body structure. Animals with backbone are classified into the following five classes according to their body structure:

A. Pisces

All kinds of fish fall in this class. Fish lives in water. Fishes are of different shapes and sizes. Some fishes are big, whereas some are small. Most of the fishes have scales all over their body. Fishes

have fins in different parts of their body to help them to swim in water. They have head, trunk and tail. They breathe through gills. They lay eggs. Shark, sea horse and different kinds of fish fall in this class.

B. Amphibia

Animals of this class can live both in water and on land. The animals of this group have smooth, moist and soft skin. They have eyes on the top part of their head which can be moved around. They have their head and trunk with their neck which is not distinctly separated. Their hind limbs are longer than their fore limbs which help them to jump. Their hind limbs have webbed feet which help them to swim in water. They have their tongue stuck to the front part which helps them to catch the insects. Frogs fall in this class. Young frogs are called tadpoles. They live only in water in tadpole stage and breathe through gills. Frogs breathe with skin when they are in water and with lungs when they are on land. They lay eggs in water. Besides frog, toad and salamander also fall into this class.

C. Reptilia

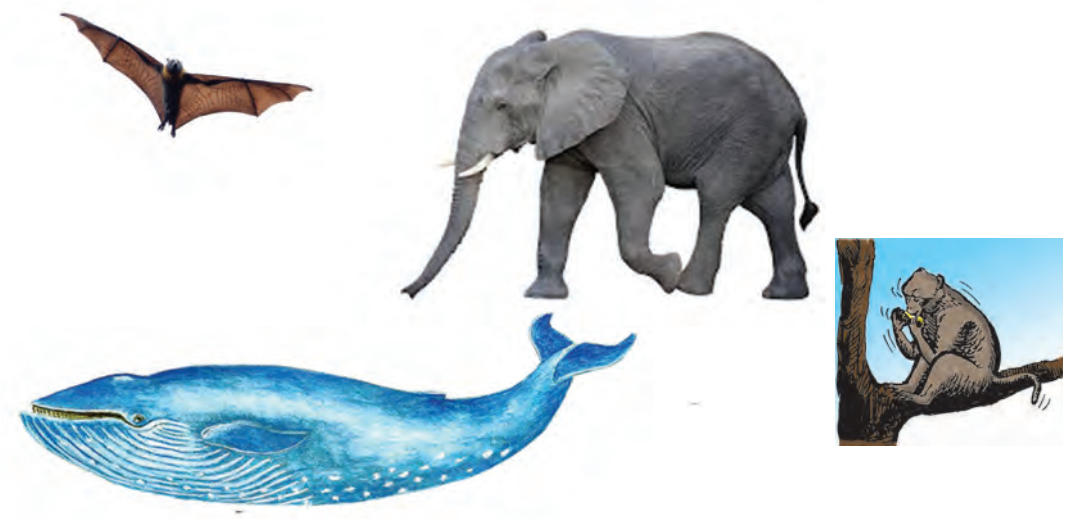
Most of the animals in this class crawl on land or on wall. Some of them also live in water. They have their head, neck, trunk and tail. Among these animals, some have four legs. Their skin is dry and some of them have hard scales all over their body. They breathe through lungs. They lay eggs. Lizards, tortoise, snake, wall lizard, crocodiles etc. are the animals of this class.

D. Aves

Different kinds of birds fall in this class. Almost all the birds can fly in the air. Birds have a pair of wings in their body. The wings have feathers. Feathers are of different colours. Feathers keep the body of birds warm and the wings help them to fly. Birds have light but developed bones in their body. Their body can be divided into head, neck and trunk. They have beaks. They breathe through lungs. Parrot, duck, eagle, ostrich, dove, penguins, etc. are the examples of this class.

E. Mammalia

Animals of this class have their body covered with fur or hair. Their body contain as head, neck and trunk and two pairs of limbs. Some of the mammals have their fore limbs developed as arms. Most of these animals have tails too. These animals breathe with lungs. They have teeth and a pair of external ears. Animals of this class have well-developed brain. They give birth to babies and females feed them from mammary gland. Mammals like whale and dolphin have their fore limbs developed as paddles which enable them to swim in water like fish. The bat is a mammal that can fly like a bird. Its fore limbs are developed as wings. Humans also fall in class mammal. Human is the most developed creature among the animals. Hare,mice, cow, cat, tiger, bear, elephant, whale, human etc. are the examples of this class.



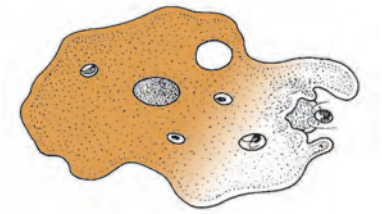
Animals without backbone

There are many animals without backbone in our surrounding. Most of the animals without backbone have hard outer cover for their protection. This group consists of the animals ranging from microorganism to crab, scorpion, snail and earthworm. We will discuss on some of these animals in this lesson.

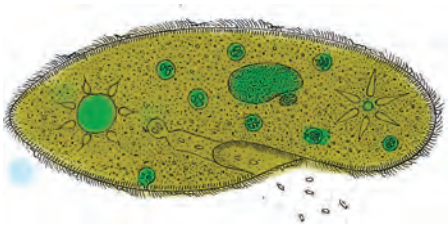
These animals are classified mainly into nine phyla. Each phylum is explained in brief as below:

A. Protozoa

The creatures in this phylum are single celled and microscopic in size and too small to be seen with naked eyes. All the life processes in their body are controlled by the single cell. They reproduce by splitting in half which is known as binary fission. These creatures are found in sea water, human body or in moist places. Amoeba, paramecium and euglena fall into this phylum.



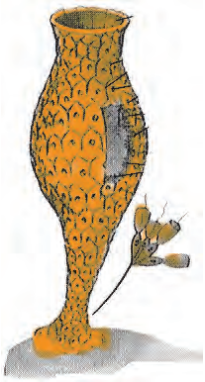
Amoeba



paramecium

B. Porifera

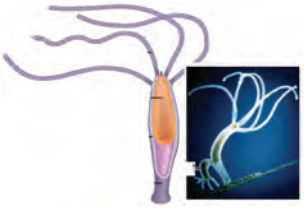
The animal of this phylum have pores on their body. Their bodies are made up of many cells. They do not have head, eyes and limbs. Spongila is an example of the creatures of this phylum.



sponge

C. Coelenterata

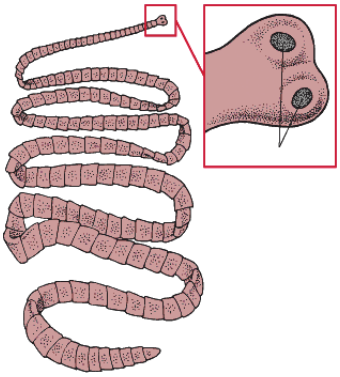
The animals of this phylum have their bodies like hollow cylinder. These animals have a single opening in their body called mouth but they have no anus. These creatures use tentacles to keep the small aquatic creatures in their mouth. They have neither head nor limbs. The reproduction of these animals also takes place by budding. Hydra and coral are the examples of this phylum.



hydra

D. Platyhelminthes

The creatures of this phylum have flat body. The shape of the body of animals is like a ribbon ar a leaf. Some of them have leaf like body. They live in the body of other animals. They live by sucking the fluid of the digested food or blood by staying in the intestines of cow, buffalo and in liver of sheep. Thus they are called parasites. Tapeworm stays in intestines of humans and pigs whereas liver fluke stays in the liver of sheep.



tapeworm

E. Nemathelminthes

The animals of this phylum have round body. The front and back parts of their body are pointed. They have both mouth and

anus. Some of these creatures live by sucking the fluids from others' body. Ascaris found in human intestines is an example of this type of parasite.

F. Annelida

earthworm

The creatures of this phylum have long, segmented and cylindrical body. The front and the back part of their body are distinctly seen. Their body is covered with smooth moisturised skin. They are found in water and in soil. Earthworms are found in soil whereas leech live by sucking the blood from the outer part of other animals' body.

G. Arthropoda

butterfly

Among the animals of this phylum, some swim in water, some live on land and some are found flying in the air. Their limbs look like jointed segments. Body is covered by skeleton. Their body is made up of three distinct parts: head, thorax and abdomen. Butterfly, housefly, spider, centipede, milipede, crab, etc. are the examples of this phylum.

H. Mollusca

snail

The animals with soft body like slug, snail, and octopus fall under the phylum 'mollusca'. The body of this type of animal is covered with hard shell. They have mouth, eyes, and tentacles on their head.

I. Echinodermata

starfish

The sea animal with their body covered with hard shells fall in this phylum. Starfish and sea urchin are the examples of echinodermata. Starfish has five arms but no distinct trunk.

Teaching Instruction

Start the lesson by observing the environment around.

Focus on the learning by providing the chance to the students for direct observation of creatures.

EXERCISE

1. Classify the following animals into two groups: 'animals with backbone' and 'animals without backbone'.

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

2. Write two examples of animals of each of the following category.

water animals, amphibia, land animals, aves.

3. Nepalese notes have pictures of different animals. Find what animals are on those notes and also write the categories of those animals.

4. Draw simple pictures of the following animals with two characteristics of each:

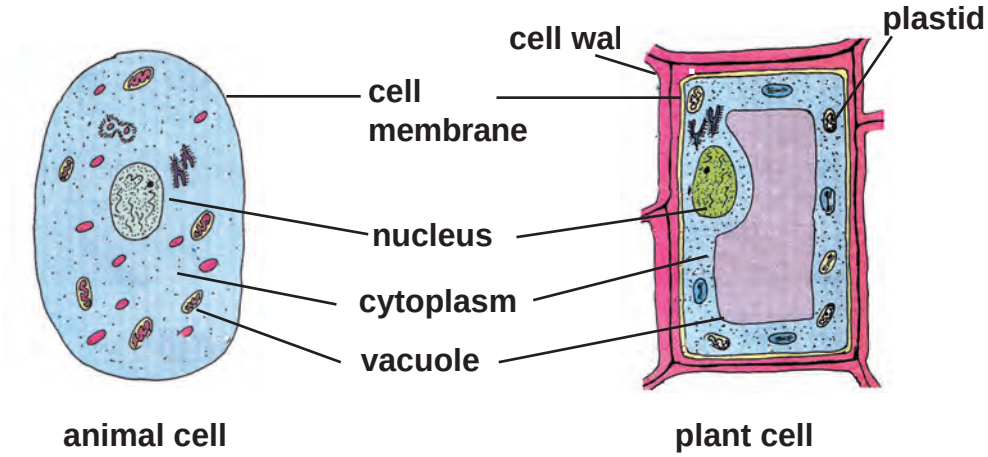
fish, bird, earthworm, snake, butterfly, frog, cow, hydra, ameoba.

Lesson 2

Cell

Different kinds of animals and plants are found around us. Some animals are big while others are small. Some animals and plants can not be seen with naked eyes. We need microscope to see these tiny animals and plants. The bodies of both small and big animals; and plants are made up of many small units. These units are called cells. All the activities required for body takes place in cells.

Plants and animals have different shapes of body however the structure of their cell is almost similar.



Structure of cell

Animal and plant cells are mainly made up of the following parts:

1. Cell membrane/cell wall
2. Cytoplasm
3. Vacuole
4. Nucleus

Cell membrane

Cell membrane is a kind of membrane that surrounds the cell. In plant cells, cell membrane lies inner to the cell wall whereas animal cells do not have cell wall.

Cytoplasm

Inside the cell membrane, there is jelly substance called cytoplasm. It contains food and other matters. Everything needed for growth and living of organism is produced in cytoplasm.

In plant cell, cytoplasm contains tiny elongated substances called plastids. Plastid contains small green pigments which are called chlorophyll. Plants prepare their food with the help of chlorophyll in the presence of sunlight. Animal cells do not have chlorophyll.

Vacuole

In plant cell, big empty spaces are seen called vacuoles. Vacuoles are temporary and tiny in animal cells. Vacuoles fetch food stuff and water to the cell.

Nucleus

Each cell contains spherical or oval nucleus. In plant cells, nucleus lies on the edge and in animal cells, it lies in center. Nucleus controls different activities of a cell.

Activity

Prepare a model of plant and animal cell with the help of string, bangle, pieces of wood, balloon, paper, etc.

Teaching Instruction

Draw and display the figures of plant and animal cells.
Show the plant cell from the membrane of onion with the help of a torch.
If possible, provide chance to the students to observe slides of plant and animal cells through microscope.

EXERCISE

1. Tick the (√) true and cross (×) the false statements.

a. All the cells do not have similar shape.

b. Animal cells have cell wall.

c. Vacuole is big and permanent in plant cell.

d. Nucleus controls the activities of a cell.

2. Match the following.

	Column 'A'	Column 'B'
a.	Vacuole	( ) flexible jelly.
b.	Chlorophyll	( ) thin net.
c.	Nucleus	( ) green colour pigment.
d.	Cytoplasm	( ) empty space.
e.	Cell membrane	( ) controls the cell activities
		( ) cell wall

3. Answer the following questions.

a. What is the smallest unit of body of living things?

b. What is cell wall? Where is it found?

c. What is cytoplasm? What does it contain?

d. Where does nucleus lie? Why is it important?

e. Write any two differences between plant and animal cell.

4. Draw and label the diagrams of plant cell and animal cell.

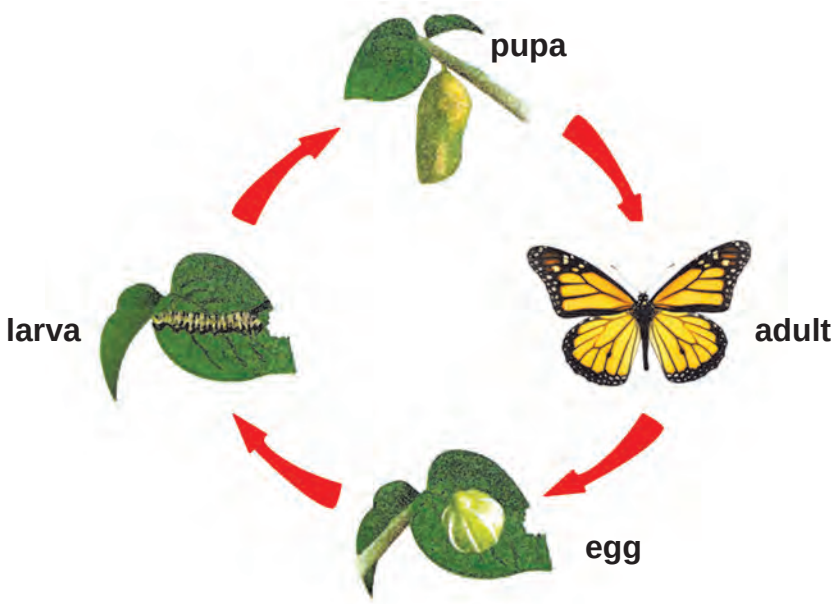
Lesson 3

Lifecycle of a Butterfly

The insects like bees, mosquitoes and flies undergo four stages of their lifecycle: egg, larva, pupa and adult. The lifecycle of a butterfly also consists of the following four stages:

1. Egg **2. Larva (caterpillar)** **3. Pupa** **4. Adult**

Each stage is explained in brief below:



1. Egg

Adult female butterfly lays eggs in line or randomly on the under surface of the leaves. The eggs are tiny and of different colours. Sticky substance helps eggs to be stuck on the leaf.

2. Larva

In few days, the colour of the eggs change and small eggs hatch into larvas. The larva of a butterfly is called caterpillar. The

caterpillar has the body made of many segments. They have legs but no wings. They grow by eating leaves of plants. They eat voraciously in this stage.

3. Pupa

When caterpillars stop eating, saliva like substance comes out of their mouth and they get wrapped with it. The pupa does not eat and does not appear to be active and this is the stage when it starts to be called pupa. The shell of the pupa is called puparium or cocoon. The pupa stays safe inside the cocoon.

4. Adult

Cocoon gets broken after some days and butterfly comes out of it. After some times, adult female butterfly starts laying eggs. Thus the lifecycle of a butterfly continues. It takes about a week for the completion of the cycle. The developmental stage from the eggs to adult butterfly is called the lifecycle of a butterfly.

Teaching Instruction

If possible, show the eggs of butterfly on the leaves of plants near the school regularly to the students to show the lifecycle of a butterfly.

Activity

Observe the flower and vegetable plants of the surroundings. You can see the leaves eaten by insects. Look at the underside of the leaves of the plants. Some leaves may contain tiny eggs. Observe those eggs for some days. Note down the changes occurred there daily.

EXERCISE

1. **Draw a figure showing the lifecycle of a butterfly and label the different stages.**

2. **Fill in the blanks with correct words.**

   a. ..... is voracious stage of the lifecycle of a butterfly

   b. The shell that covers pupa is called.....

   c. There are ..... stages in the lifecycle of a butterfly.

3. **Answer the following questions.**

   a. What is lifecycle?

   b. Write names of any three insects which have four stages in their lifecycle.

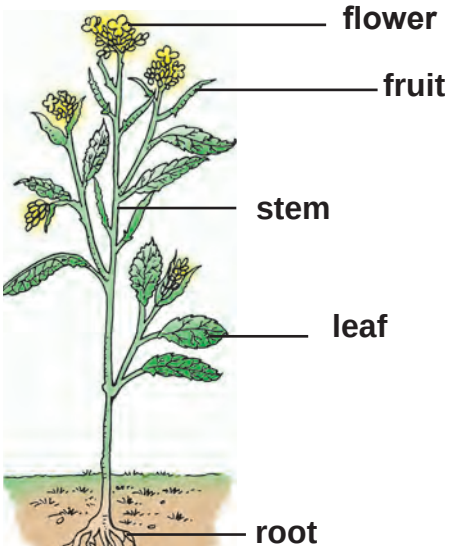
   c. Briefly explain the lifecycle of a butterfly.

Lesson 4

Monocot and Dicot Plants

Flowering Plants

Observe the plants found around your house, school and in neighborhood. Some parts of the plant are under the soil. The lower part of the plant which is under the soil is called root and the part that is above the soil is called shoot. A stem holds leaves, flower, fruit, etc. These types of plants germinate from seeds.



Take and observe a mustard plant or any other flowering plant. Find the colours of root, stem and leaf. Roots are white or brown in colour. Stem and leaves are green. The flowers of flowering plants vary in colour like red, yellow, pink, purple, etc.

Different parts of flowering plants and their functions

Root

The part of a plant under the soil is called root. This is white or pale brown in colour. The root of some plants grows deep into the soil. In this type, the main root has further small and thin hair-like structures growing from it. This type of root is called tap root system. The plants like gram, pea, mustard, chick pea and pea have tap root system. Some plants do not have main root instead they have bunch of root. This type of root is called fibrous root system. The plants like paddy, maize have fibrous root.

Functions of roots

1. Roots help to keep the plants firm in soil.

2. Roots absorb water and other minerals for plants from the soil.

Stem

The stem is thicker near the roots and as it grows it becomes thinner. Different branches grow from the stem of a plant. These branches have leaves, flowers and fruits. Some plants do not have branches.

Functions of stem

1. Stem helps plant to stand.
2. The absorbed water and minerals transfer to other parts of a plant through stem.
3. The food prepared by the leaves reaches other parts of a plant through stem.

Leaf

Different plants have leaves of different shapes and sizes. Plant leaves can be classified into two main types. The leaf of the dicot plants like mango, mustard, etc has one mid rib. Other small veins spread from the mid rib and it looks like a net. The leaves of the monocot plants like wheat, maize, etc have parallel veins.

Functions of leaves

1. The green leaves prepare food for the plants.
2. The leaves absorb carbon dioxide and release oxygen in photosynthesis and take in oxygen and release carbon dioxide in respiration.
3. The leaves throw excess water.

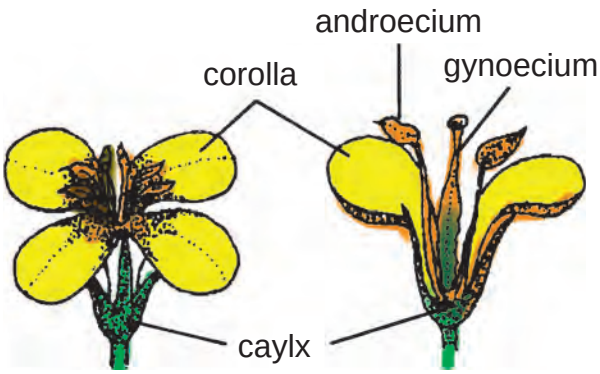
Flower

There are different kinds of flowers. They also vary in colour. The most attractive part of a plant is flower. Flowers give fruits

and seeds. New plants grow from seeds. Go around your house or school to find out the flower plants and observe the colour, size, etc. of the flowers. Some plants have separate male and female flowers of whereas some other flowers have both male and female organs in a single flower.

Different parts of a flower

A flower has mainly four parts: calyx, corolla, androecium and gynoecium.



Calyx

The outermost part of a flower near the pedical is called calyx. It is a ring of small leaves. It is green in colour. It protects the flower when in bud condition .

Corolla

The colourful part inside the calyx is called corolla. In other words, it is the ring of petals around the central part of a flower. This is the most attractive and most beautiful part of a flower. Different flowers have corolla of different shapes and colour. Corolla attracts humans and insects.

Androecium

Androecium is inside the corolla. It is the male reproductive organ of a flower. It is made up of long filament supporting small bag like structure called anther. The anther contains dust like particles called pollen . The pollen helps in pollination process of a flower.

Gynoecium

Gynoecium lies in the middle of a flower. It is the female reproductive part of a flower. The upper part is like a tube and the lower part is swollen. The swollen part is the ovary. which

later changes into fruit and seeds.

Fruit

Flowers grow into fruits in plants. Fruits contain seeds inside them. Fruits protect seeds and help to spread seeds.

Seed

Fruits contain seeds inside them. When the fruits ripen, seeds too become matured. New plants germinate if seeds get favourable environment.

We have different types of plants around us for example: grass, paddy, wheat, sugarcane, maize, vegetables, chick pea, pea, soyabean, pumpkin, broad bean etc. These plants are categorized into monocots and dicots on the basis of the structure of their seed.

Monocot plants

Paddy, wheat, maize, barley, onion etc. are monocots. The seeds of these plants can not be separated into two cotyledons. Monocot plants have fibrous root. They have long leaves. The veins of leaves are parellel.

Dicot plants

Chick pea, pea, soyabean, pumpkin, green bean, broad beans etc. are dicots. The seeds of these plants can be separated into two cotyledons. Dicot plants have tap root and the tap root has several secondary roots and root hair. Dicot plants have broad leaves. A leaf contains one main mid rib. Which has other small

---

veins spreading like a net.

Teaching Instruction

While teaching the parts of plants, bring a plant as a sample and give them chance to observe the different parts so that the students directly recognize the leaf, flower, fruit, root, stem, seed etc.Try to make the students recall the

fact that plants take in oxygen and throw out carbondioxide in respiration and they absorb carbondioxide and release oxygen in photosynthesis.

Observe the plants around you and categorize them into two groups: monocots and dicots.

EXERCISE

1. Fill in the blanks with correct words.

a. Roots help a plant to ..... in the soil.

b. Shoot remains ..... the surface of the earth.

c. The outermost part of the flower is called.....

d. The male reproductive organ of a flower is called.....

2. Match the following.

Column 'A'	Column 'B'
a. Female organ	( ) green
b. Androecium	( ) colourful
c. Calyx	( ) pollen grain
d. Corolla	( ) gynoecium
	( ) fibrous root

3. Categorize whether the following plants are monocots or dicots.

mango, apple, pumpkin, wheat, maize, soyabean, pea, garlic, orange, paddy, gram.

4. Draw a picture of each of monocot and dicot plants so that they can be distinguished. Also label the different parts.

Lesson 5

Life Processes of Animals and Plants

5. Draw a figure of a flower and label the different parts.

Different processes are conductly in the bodies of living things for their living. Such processes are called life processes. We will study simple life processes of animals and plants in this lesson.

1. Nutrition

All living things need food and water for their living. Living things get energy from food. The energy acts as fuel for running different bodily activities. Because of the fact that the green plants have chlorophyll, they are capable of preparing their food themselves. The process by which green plants prepare their food from water and carbondioxide in the presence of sunlight is called photosynthesis. Green plants which prepare food themselves are called autotrophs. Paddy plant, mustard plant, etc. are the examples of autotrophs. The plants having no chlorophyll and the animals can't prepare their food themselves. These plants and animals must depend directly or indirectly on green plants for their food. The plants like fungus or mushroom having no chlorophyll can't prepare food themselves. The animals like goats or hare eat green plants or different parts of the plants as their food whereas the animals like tiger, jackle, lion, etc. eat other animals for their living. The animals that

can't prepare their food themselves are called heterotrophs. The plant eating animals (herbivores) like goat and hare and flesh eating animals (carnivores) like lion and tiger are heterotrophs. Similarly, those animals who eat both plant and flesh eating animals (omnivores) like humans and the plants that can't prepare food by themselves like fungus and mushroom also fall under heterotrophs.

2. Respiration

All living things need oxygen for breathing. They get oxygen from the air. Living things inhale oxygen and exhale carbondioxide and water vapour in breathing process. In breathing living things inhale oxygen from the air which reaches to all their cells. The oxygen helps to break the food and produce carbondioxide, water and energy. The excess water and carbondioxide are thrown out. Animals don't need cabondioxide but plants need it in photosynthesis so the carbondioxide exhaled by all the animals is reused by the plants. Plants again produce oxygen after photosynthesis in the air. In this way, the balance between oxygen and carbondioxide is maintained and life process of the animals and plants goes on.

3. Internal transportation

The food, water and other minerals are to be transported from one part of the body to other parts of livings things for their living. This process is called internal transportation. This process is needed primarily to fetch food, water, oxygen and other useful matters to the different parts of body. This process also includes the activity to fetch the waste materials produced in the body to the excretion parts. Blood does not work of transport in developed animals. The same process is applied in the plants to fetch the absorbed water and other minerals to the leaves via stem. The food prepared on the leaves also reaches to the different parts of a plant like: root, branch, leaf, fruit and flower by the same process.

4. Excretion

Different waste materials are produced in the body during the life process of living things. These wastes are harmful to the body. They must be removed from the body regularly. This processs of throwing unwanted materials is called excretion. Animals excrete the wastes like: stool, urine, sweat, mucus, cough and carbondioxide. Plants do not excrete visibly like animals. Exhaling carbondioxide, throwing excess water through the leaves etc. are the excretion processes in plants.

5. Reproduction

Living beings produce their young ones like themselves. The process of producing the young ones to continue the race of living beings is called reproduction.

The paddy plants produce rice from which paddy plants grow. If a potato is planted, we get potatoes. Similarly animals reproduce through different processes. Birds, snakes, crocodiles, frogs, fish and insects lay eggs and those eggs develop into their young ones. Animals like humans, dogs, cows, mice, cats, horses, etc. reproduce by giving birth to their babies.

Interrelationship between animals and plants

Animals and plants are interdependent for their living. Food gives energy to the animals. Plants and animals can't live long without food. Animals and plants help each other for food. Animals are heterotrophs So they can't prepare food for themselves. Among them, herbivorous animals feed on the whole or the parts of a plant. Different parts of a plant store food. The plant is eaten by animals as their food. Animals feed on the things like: sweet potato, potato, ginger, sugarcane, cabbage, cauliflower, apple,

tomato, etc. Among the heterotrophs, carnivorous animals like: tigers and lions, feed on the herbivorous animals. Omnivores eat both animals and plants. When one type of animal eats another type of animals, the energy gained from green plant as the food by the first animal is transferred to the second one. Thus, there is a strong interrelationship between plants and animals for food.

Interrelationship between living beings and environment

Plants depend on the environment for the materials required for preparing their food. In the same way, animals depend on the plants for their food. A plant leaf has tiny pores. They are called stomata. The carbondioxide in the air reaches into the leaf through the stomata. When water, carbondioxide and other minerals reach the leaf, plants prepare food (glucose) with the help of chlorophyll through the process of photosynthesis. In this process, oxygen gas is also produced which goes out in the air through stomata. Living beings absorb oxygen from the air and in respiration process; there occurs combustion between oxygen and food which in turn results into the production of carbondioxide which is exhaled by the living things and thrown outside during breathings.

The waste materials excreted by the animals and dead bodies of plants and animals are decomposed by micro organism into simple substances. These substances are mixed in the soil. Living being get oxygen, carbondioxide from environment and they get water and other minerals from the soil. The surplus amount of these things goes back to the environment. This helps to maintain balance in environment. Thus, living things depend directly or indirectly on environment. Similarly, living things have a great role in maintaining environmental balance.

Activity

Keep some water in a bowl and put some mustard, gram, peas or beans and leave them for two or three days. Observe daily and note down the changes occurred in the seeds.

EXERCISE

1. Fill in the blanks with correct words.

a. Animals get..... from food.

b. Plants inhales ..... gas in respiration.

c. Plants take in ..... gas in photosynthesis.

d. Animals and ..... help to maintain balance between oxygen and carbondioxide gas in atmosphere.

2. Make corrections if the following statements are false.

a. Plants need only water and air for their growth.

b. Animals do not depend on the plants for their living.

c. All plants prepare their food by themselves.

d. Plants excrete water from roots.

3. Write short answers.

a. How do plants get carbondioxide gas in preparing their food?

b. What elements are required for plants to prepare food? Where do they get them from?

c. Write any four life processes of living things and explain them.

Lesson 6

Effects of Human Activities on Environment

Living things around us (plants and animals) and non-living things (air, water, soil, etc) together form environment. The essentials for human beings: air, water, food and habitat are obtained from environment. Conservation or destruction of environment depends on the human activities. Our activities pollute the environment hence affect animals, plants, water, air etc of environment. Our bad habits like: reckless excretion, reckless throwing of garbage, allowing animals around the sources of water, producing smoke and dust etc also pollute environment. The bad effects of human activities on air, water, land and forests are explained below.

Air

All the living things including plants and animals get oxygen from air for breathing. No living things remain alive without oxygen. Humans pollute the air containing oxygen by different ways.

Causes of air pollution

Smoke emitted from burning of firewood and kerosene, moving vehicle and smoke burning coming from burning plastic

Different gases and dust particles emitted from industries

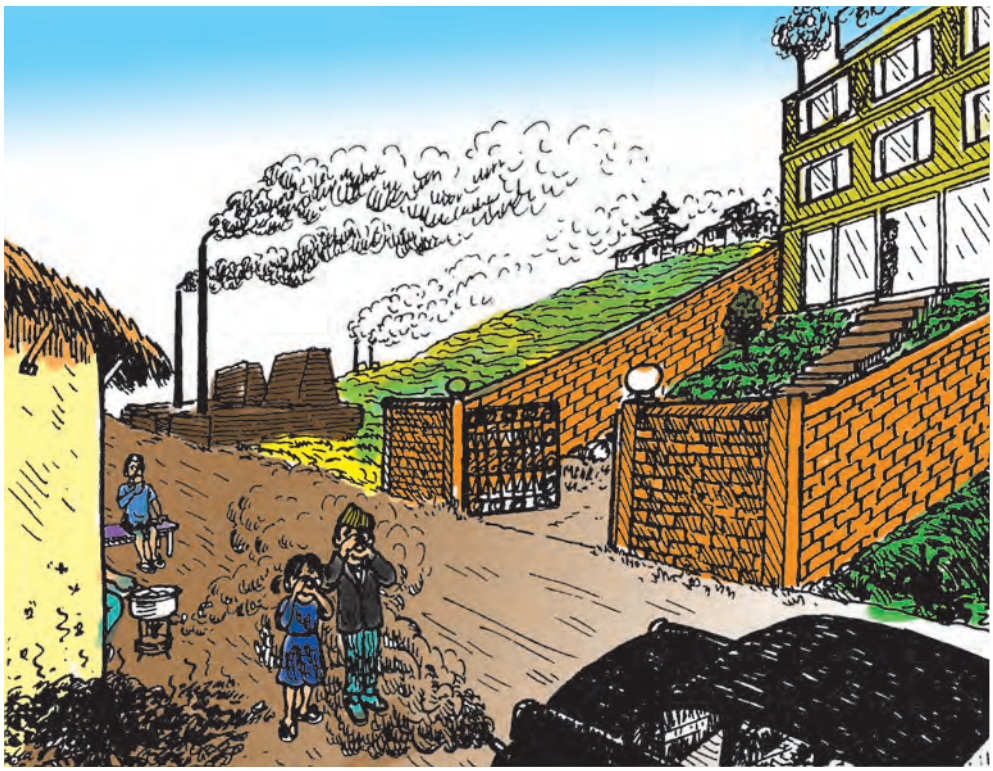
Dust produced while constructing and destroying houses and roads

Smoke from forest fire burning of tyre, and vehicles

The garbage coming out from house and hotel and bad smell of dead animals thrown carelessly

Effects of polluted air

The smoke and dust particles mixed with the air cause respiratory diseases like: pneumonia, bronchitis, lung cancer, etc. and skin



diseases. The polluted air also affects climate change. It also affects the plants, birds and animals as well.

Water

Water covers two third surface of the earth. Water is found in three forms: liquid, solid (snow) and gas (vapour). All the living

things have water portion greater than other elements. Plants and animals cannot live without water. Humans use water for drinking, washing, irrigation, in factories and in generating electricity. How do you feel if you do not get water when you are thirsty? What happens if the plants in vase are not watered? Have you ever thought over this? Despite its great importance, water gets polluted because of us.

Causes of water polltion

Bathing in the sources of water like: river, stream, pond, etc. and excretion near the sources of water.

Bathing and grazing animals near the sources of water.

Not managing proper drainage system.

Mixing the polluted water containing chemicals from the factories in the river.

Dumping the household garbage, wastes from hospitals and factories on the river banks.

Throwing wastes into the water.

Excessive use of pesticides and chemical fertilizers.

Excessive use of water purifying chemicals like; lime, potas and chlorine.

Washing the vehicles in the sources of water.

Effects of polluted water

Polluted water contains different kinds of germs. Contaminated water causes the communicable diseases like cholera,dysentry, typhoid, jundice, and cancer, etc. Polluted water affects the plants and animals found in water. polluted water also polute the soil.

Soil

One third of the earth's surface is covered by land. The land is mainly made up of soil. It is the soil where all the plants grow and die. The plants grown on the land are our sources of food. We have not paid our attention to the pollution of such important and useful soil.

Causes of soil pollution

Harmful chemicals from factories

Excessive use of pesticides and chemical fertilizers

Throwing plastic and non-decaying products in the soil

Leaving the drainage channel carelessly

Effects of soil pollution

Plants are badly affected by soil pollution

Fertility of land decreases

Affects the animals living in the land

Forest

Forest plays an important role in the conservation of climate of the environment. The nature of the animals and plants found in the forest is different according to the geographical structure. We obtain wood and firewood, different kinds of herbal medicine, fruits and grass from the forest. It provides habitat for wild animals and birds. Since forest contributes to maintain natural beauty, it also helps in promotion of tourism industry.

You must have heard or seen domestic and foreign tourists roaming the different places of our country to see the animals like: elephants, rhinos, tigers or bears and to enjoy the natural scenery. Human activities have caused destruction of such useful forests. The motto 'Green forest: Property of Nepal' is being proved wrong due to bad activities of humans.

Causes of deforestation

Cutting down forests for food and shelter due to the population growth

Smuggling of wood and poaching of wild animals

Grazing the domestic animals in the forest and letting them untamed

Forest fire

Effects of deforestation

Occurrence of flood, landslide, low rainfall, excesssive rainfall, partly rainfall and drought

Destruction of plants and wild animals

Decrease in the water sources

Environmental pollution caused by the setting of forest fire

Flood, landslide and soil erosion

When water overflows from rivers or stream than normal, it is

called flood. During rainfall soil becomes wet and heavier and slides downward which is called landslide. You must have known the damage of people and property caused by flood and landslide.

The sliding of the soil of the surface due to flood, landslide and rainfall is erosion. Erosion takes away the fertile soil of the surface which causes decrease in the fertility of soil. Although landslide and erosion are the natural disasters, humans play greater role in their occurrence.

Causes of flood, landslide and erosion

Indiscriminate cutting of trees

Absence of terrace farming on hills

Encroachment of river banks

Activity

1. How are the water taps, ponds, rivers, well, etc. in your locality being pollutted? Observe and make a short note.
2. Go around your locality and make a list of human activities that cause air pollution.

EXERCISE

1 Put a tick (√) if the statements are correct and a cross (×) if they are wrong.

a. Polluted air is injurious to health. ( )

b. Humans have no role in air pollution. ( )

c. Drainage channels should not be mixed in river and ponds. ( )

d. Population growth is the main reason of deforestation. ( )

e. Terrace farming does not cause erosion. ( )

2. Fill in the blanks with correct words.

a. We should not use water purifying..... more than required.

b. Air gets polluted from..... and .....of the moving vehicle.

c. Water gets.....from the mixing of water with chemicals from factories into the rivers.

d. We should only carry out terrace ..... on the sloppy land.

3. Answer the following questions in short.

a. What activities of humans cause air pollution?

b. Mention the causes of water pollution.

c. What are the main causes of deforestation?

d. Define erosion. What activities of humans cause erosion?

e. List the effects of polluted water and polluted air on humans.

Lesson 7

Environment Conservation

How is the environment around us formed? What are the effects of human activities on animals, air, water, etc. of environment? We have already studied these things in the previous lesson. Human activities do not only affect air, water, soil, plants and animals, they also affect useful creatures found in soil, water and air. The following things are to be considered to eliminate the pollution and imbalance in environment caused by human activities:

a. Not producing smoke and dust unnecessarily

We should use improved oven that does not produce smoke. Biogas, electricity and solar energy are to be used instead of the fuels like: firewood and kerosene. Electric vehichles should be given priority. Fume producing vehichles are to be examined on timely basis to control the fume. Afforestation and planting trees on road sides should be done for minimizing dust. Industries

should be established away from cities so that air and water pollution can be minimized. Dead animals and wastes should be buried in proper place so that the germs and the bad smell will not spread in the air. Reckless excretion by humans should be stopped.

b. Stopping of poaching of animals

Birds and animals live on the things found in the forest. One animal eats another animal. Tigers live on deer, jackle, etc. Eagles remain alive by eating birds. Humans poach animals to fulfill their needs. Such activities affect on environmental balance because of the decreasing of animals. When the number of tigers in the forest decreases, the number of deer increases. When smaller birds decrease, the eagles will die due to lack of food. Hence their number too decreases.Thus humans should stop reckless killing of wild animals.

c. Stopping of setting forest fire

Forest is the habitat for wild animals and their source of food. Deforestation results into the decrease in number of wild animals. Humans get grass, firewood, herbal medicine etc. from the forest. Human life will become difficult if deforestation occurs because we get no more benefits from forest. Humans set fire to the forest knowingly or unknowingly which results into the destruction of valuable animals, plants and other creatures. So recklesss forest fire should be stopped. We all together should put out forest fire if it occurs.

d. Conservation of forest

Forest is the natural resource required for all animals. Its excessive use decreases the area of forest. So, we should stop indiscriminate cutting of trees. Domestic animals should not be left in the forest. This helps in conservation of forest. When humans work for the conservation of forest, environmental degradation won't occur. In this way, conservation and protection of forest helps in conservation of environment too.

e. Forestation

We have empty places around us. When we keep them empty, they look dry. Trees are to be planted in such places. Such action prevents environment from being degraded. Trees are beneficial

for humans and animals. The roots of trees firmly capture the soil and prevent from flood and landslides. They can also store the water that the sources of water do not decrease.

f. Protecting the sources of water

We should not destroy well, tap, pond, etc. around us. They should be kept neat and clean. If they are filled with mud or other things, they should be taken out to bring them back in to the previous state. They should be protected. The sources of water help plants, animals, humans and other creatures to be alive. To protect the water sources from being polluted, the drainage channels should not be linked with the rivers directly. Drainage, polluted water from factories and wastes should be properly

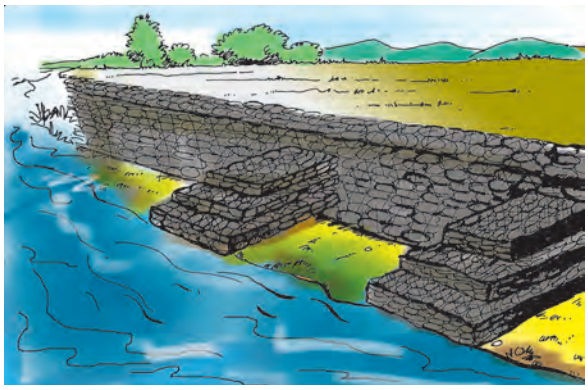
managed away from the sources of water. Human should stop to defecate and urinate near the sources of water.

g. Proper farming

In the sloppy areas, terracce farming should be done to stop landslides. This way of farming prevents the fertile soil from being carried away by the water. It also helps to conserve the fertility of soil. It decreases the probability of landslides too.

h. Building embankment

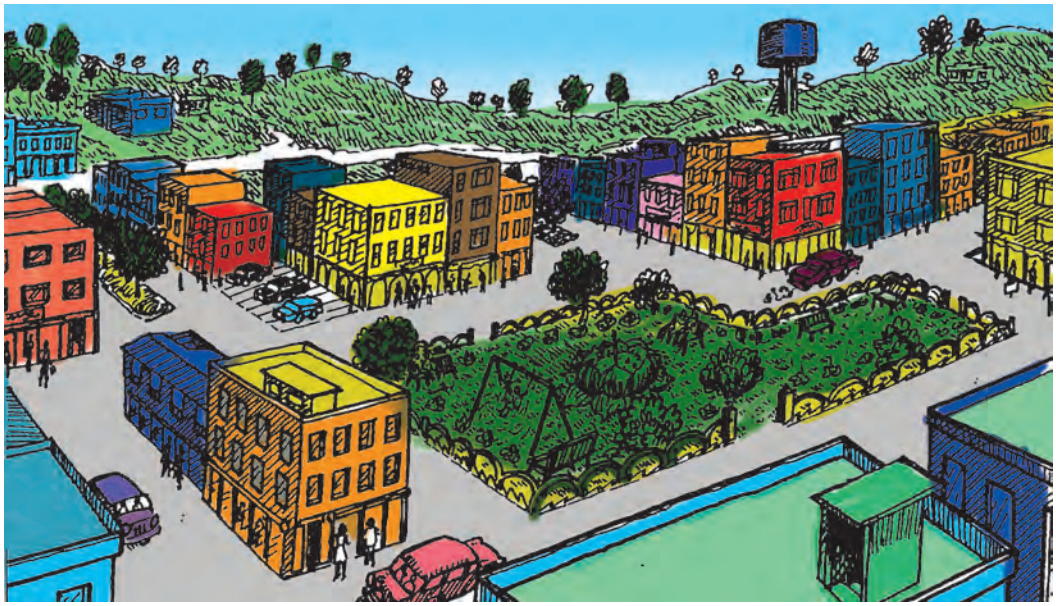
Letting the rivers run recklessly increases the possibility of flood and landslides. So dam and embankments should be built in the rivers. Trees should be planted along the rivers.



i. Planned urbanization

Because of the fact that the number of people in urban areas is higher, houses and means of transports are also higher in number.

Similarly, there are only a few trees in urban areas. Thus, the environment is unhygienic. Reckless construction of houses in most of the cities results into unplanned settlement. Such settlement is known as unplanned urbanization. In unplanned urbanization, environment is much polluted. For planned urbanization, certain spaces should be left open between houses. Trees are to be planted. There should be the availability of water, toilets, drainage system, shopping centres, hospital, school and public transport.



j. Proper mangement of garbage

The management of waste is an important aspect of environment conservation. The gas and water from hospitals and factories are to be purified before mixing them into river, soil and air. House hold garbage is to be categorized into two groups: decaying and non-decaying for proper management.

Teaching Instruction

Take the students for a short trip to a village or a city around the school. Discuss with the students on the activities that contribute to pollution, preventive measures adopted and the things to be done to prevent pollution. Organize field trip if possible.

EXERCISE

1 Put a tick (√) if the statements is correct and a cross (×) if it is wrong.

a. Trees are to be planted to decrease the pollution caused by smoke and dust. ( )

b. Rivers are to be let flow freely without making embankments. ( )

c. Forest fire destroys wildlife and plants. ( )

d. Farming is to be done in sloppy land as it is. ( )

e. Unplanned urbanization increases environmental pollution. ( )

2. Answer the following questions in brief.

a. What can be done to protect air from being polluted? Write any two measures.

b. How does afforestation help in environment conservation?

c. How does the terracce farming in slope areas help in land conservation?

d. What things can prevent flood, landslide and soil erosion? Write any two measures.

e. What is unplanned urbanization? How can it be made planned?

Lesson 8

Change in state of Matter

Change in states of matter

Matters have three states: solid, liquid and gas. Ice is the solid state of water. When it is heated, it changes into water. Water is the liquid state. When water is heated, it changes into steam which is known as the gas state of water.These three states of matter when heated or cooled, change into another state.

Ice (solid) $\xrightarrow{\text{heated}}$ water (liquid) $\xrightarrow{\text{heated}}$ vapour (gas)

Vapour (gas) $\xrightarrow{\text{cooled}}$ water (liquid) $\xrightarrow{\text{cooled}}$ Ice (solid)

When matter changes from one state to another state, it is called the change in state of matter.

Activity

Melting

1. Put some pieces of ice into a beaker. Heat the beaker with a burner or with a spirit lamp. What happens when the beaker is heated? Observe. The ice in the state of solid, when heated, gets heat energy and the ice changes into water. The solid matter when heated changes into liquid. This is called melting.

Freezing

2 Take a candle. Light it with a match. What do you see there? Tilt the burning candle a little. The wax in the liquid state pours over the floor. What happens to the wax after it is cooled? Observe. When a candle is lit, it gets heat and changes into liquid wax. The poured wax over the floor becomes cooler and freezes. The change of matter from liquid into solid by cooling is freezing.

Sublimation

3. Put some pieces of camphor into a basin and cover with a glass funel. Put a test tube upside down over the narrow part of the cone. Cover the test tube with wet cotton. Now heat the basin with a lamp and observe. What change occurrs in camphor?

When camphor is heated, it directly changes from solid into gas. The gas state of camphor when cooled directly changes into solid state. The change of matter from solid to gas by heating is sublimation.

Evaporation

4. Take some water in a kettle. Heat the kettle. Observe. What comes out of the kettle when the water boils?

When the kettle is heated, the water in it gets heat energy and it boils. When water boils, surface water changes into steam and goes up. When a matter in liquid state changes into gas by heating, it is called evaporation.

Condensation

5. Repeat the activity 4. When water starts boiling, put a cold plate just over the steam. What happens when steam becomes cool? Observe.

When steam loses the heat energy, it changes into water. The change of matter from gas state into the liquid state is called condensation.

EXERCISE

1. Put a tick (√) if the statements are correct and a cross (×) if they are wrong.

a. There occurs no change in the state of matter by heating or cooling. ( )

b. When the solid changes into liquid by heating, it is called melting. ( )

c. Comphor changes into liquid when heated. ( )

d. When water changes into steam by heating, it is called evaporation. ( )

e. When liquid becomes solid by cooling, it is called freezing. ( )

2. Fill in the blanks with correct words.

a. Liquid wax becomes ..... when it becomes cooler.

b. When comphor is heated, it changes into ..... state.

c. When water vapour is cooled, it looses.....

d. The process in which liquid changes into solid by cooling is called……..

e. When water vapour is cooled, it becomes……..

3. Write short answers to the following questions.

a. How does the change in the state of matter occur? Write with examples.

b. How can water be changed into ice?

c. What is evaporation?

d. What is sublimation?

e. Write with examples of any three changes in the state of matter in daily life.

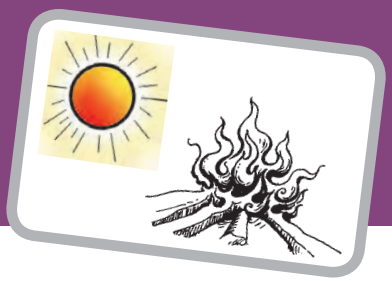
4. Draw diagrams for the following processes. Also write the names of different states:

a. Water vapour changing into water by cooling.

b. Comphor changing into gas by heating.

Lesson 9

Sources of Energy



Energy is needed for different purposes: to cook food, to boil water and milk, to move bus or truck, to dry clothes, to keep body warm and to run industries and factories. From what do we get energy? Energy can be obtained from the sun, kerosene, firewood, coal, diesel, petrol,natural gas, etc.

All kinds of sources that give energy are called sources of energy. Among the sources of energy, we can use the sun, forest, air, water etc. continuously.

The sources of energy like: petrol, diesel, kerosene, natural gas etc. are obtained from mine. It takes longer time for these sources of energy to form. When we take out these sources from mine, the mine becomes empty. We cannot make them when required. These sources of energy are called non-renewable sources of energy.

Activity 1

Collect the names of sources of energy available inside or outside your house. Fill in the table given below with sources in correct columns:

S.N.	Sources of Energy	Renewable	Non-renewable
1.	Kerosene		
2.			
3.			

Forms of energy

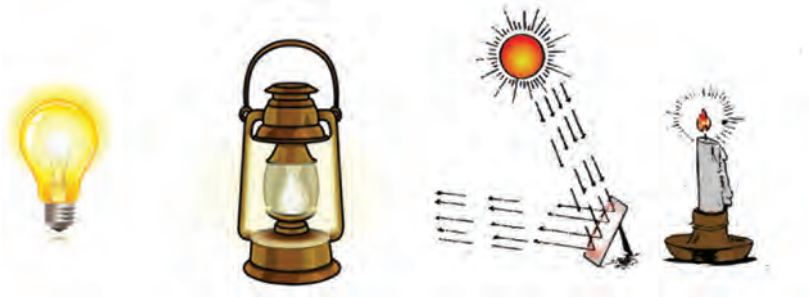
We get energy in different forms. What are the sources of energy that we use in our daily life? Heat energy, light energy, sound energy, electrical energy, magnetic energy, etc. are the different forms of energy.

Heat energy

We get heat from the sun and other burning objects. We can get heat from electricity too. Heat energy keeps objects warm. Objects become cooler if they do not get heat. Heat energy brings objects in motion, e.g. when water boils, it moves up and down. Heat brings change in the objects e.g. when firewood burns, it changes into ash and coal, furthermore there comes out smoke, heat and light. Similarly, heat brings change in the states (solid, liquid, gas) of matter.

Light energy

We can obtain light energy from the sun, burning object and electricity. With the help of light, we can see an object. We cannot see in the dark. Burning objects give both light and heat at the same time. For example: heat and light comes from the sun .



Sound energy

The energy produced by vibrating or sounding objects is called sound energy. We hear the sound produced by the object. The

objects move when sound is produced. Bell, Sitar drum, etc. are the sources of sound. These instruments vibrate when they are played for music or sound. When a moving object vibrates, the effect of viberation falls on the other object it produces sound.

Activity 2

Keep a drum (MADAL) so that it stands vertically. Scatter the chalk powder on the black area. Strike with your finger outside the black area. Observe, what happens to the chalk powder? What might be the reason ?

Electric energy

The cells in torchlight are the sources of electricity. These cells generate electricity. The generator is run by running water which produces electricity that we use in our house. The electricty produced in this way is called hydroelctricity. We can obtain heat and light from electricity. Instruments like radio, television run with electric energy.

Magnetic energy

The energy that a magnet possesses is called magnetic energy. A magnet pulls iron or objects made of iron. Objects made of iron are lifted with the help of magnet in factories. Magnetic energy is also used in telephone, bell, radio, etc. A magnet shows N & S direction when hung freely due to its magnetic energy. Thus, north-south direction can be easily identified with the help of a magnet.

Activity 3

Take a bar magnet. Take the magnet near the collected items like pin, paper clip, wood dust, pieces of glass, peebles, iron nails, steel spoon etc one by one. Observe and fill in the following table copying it in your exercise book.

S.N.	Objects	The magnet attracts/ repels
1	Pin	
2		
3		

Use of energy

We do many things like reading, writing, running, jumping etc. from morning to evening. Others also play games and carry loads. You must have seen people doing different works. We make other animals carry load or plough the field. Energy is required for us or for other animals to do work. We obtain food and energy from plants and animals. But plants obtain light and heat energy from the sun. We and other animals also get heat and light energy from the sun as well.

The moving water also possesses energy. The moving water helps in operation of watermill (GHATTA). Moving wind also posseses energy. The energy from wind helps to move fan.

Light and heat energy is very important for us. Nothing can be done without light. Like light energy, we use heat energy in different activities. Heat keeps us warm. We dry wet clothes and grains in the sun. The heat energy changes the water into vapour. The water in the vapour becomes cool and comes to the Earth in the form of rain. The heat needed for the germination of seeds is also obtained by the sun. It is also required to convert milk into curd. Heat is required to hatch out chicken from eggs.

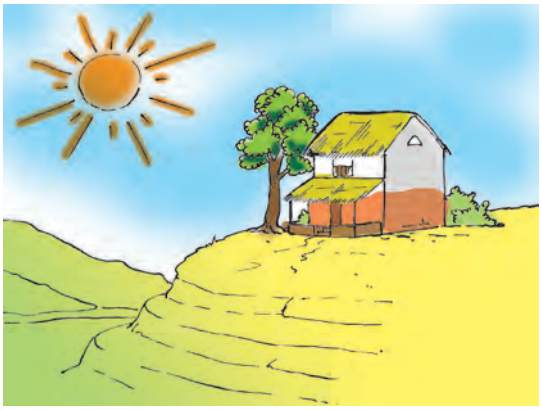
The things like: ghee, wax, ice, etc are melted by heat and different items are made by melting iron and silver using the heat.

The running water with high speed is used to generate electricity. Heater, fan, radio, television, etc. need electric energy for the functioning of electric items.

The magnet used in television, receiver, loudspeaker etc. helps to produce sound. Dynamo of a bicycle, electric motor etc. also function using the magnetic energy.

The sun as the main source of energy

The sun is the main source of energy on the earth. The earth gets light and heat energy from the Sun. The plants prepare food with the help of its heat and light energy. Other animals get their food from the plants. Organisms get energy from food.



None of the organisms on the earth can survive in absence of the sun. The heat energy from the sun changes water into vapour and that vapour comes down the earth in the form of rainfall and rivers are formed. We can generate electricity from water. In absence of the sun, all the water on the earth becomes ice.

Solar cooker and solar heater are popular nowadays. Calculators, traffic lights and vehicles are also in operation with solar energy. Solar energy is the best alternate source in energy crisis.

Energy crisis and ways of conserving energy

The Earth has limited storage of natural gas, coal, petrol and diesel. People have been using these sources of energy carelesly. Such use will surely lead to the time when the storage of these sources of energy will be empty. Such situation is called energy crisis. To minimize the energy crisis in future, the following measures can be adopted to conserve energy:

Minimize the use of coal, petrol and diesel

Increasing the use of alternative energy like: wind energy, solar energy etc

Developing electric vehicles

Emphasis on the use of biogas

Planting trees for firewood and timber

Stopping the unnecessary use of electricity and fire

Increasing the use of bio fuel, etc

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. Coal is a renewable source of energy. ( )

b. Heat and light are obtained from the Sun and from the burning objects. ( )

c. Heat and light can not be obtained from electric energy. ( )

d. A magnet attracts the objects made of iron. ( )

e. Electricity is generated from the current of moving water. ( )

2. Fill in the blanks with correct words.

a. All the animals get..... from food.

b. Plants prepare their..... from heat and light energy obtained from the Sun.

c. Sound comes from.....

d. ..... and ..... objects can be identified with the help of a magnet.

3. Answer the following questions in short.

a. What is meant by renewable source of energy?

b. From the following sources of energy, categorize them into renewable and non-renewable sources of energy:

i. coal ii. petrol iii. wind iv. biogas v. sun vi. diesel

c. What are the five forms of energy? Write.

d. What is the use of energy in daily life?

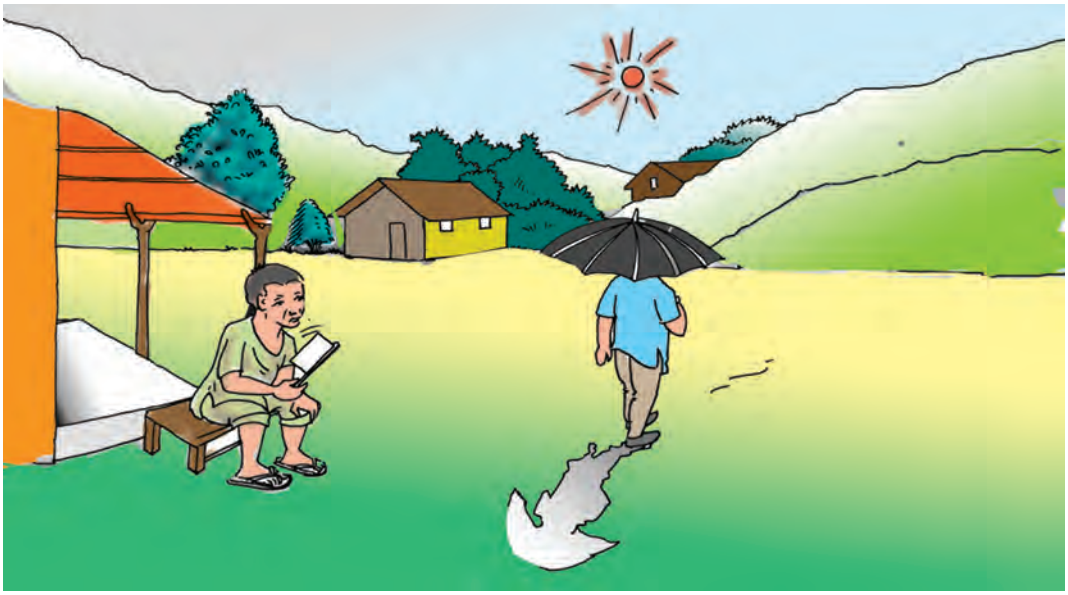
e. "The sun is the main source of energy", Why?

f. Write any four measures to conserve energy.

Lesson 10

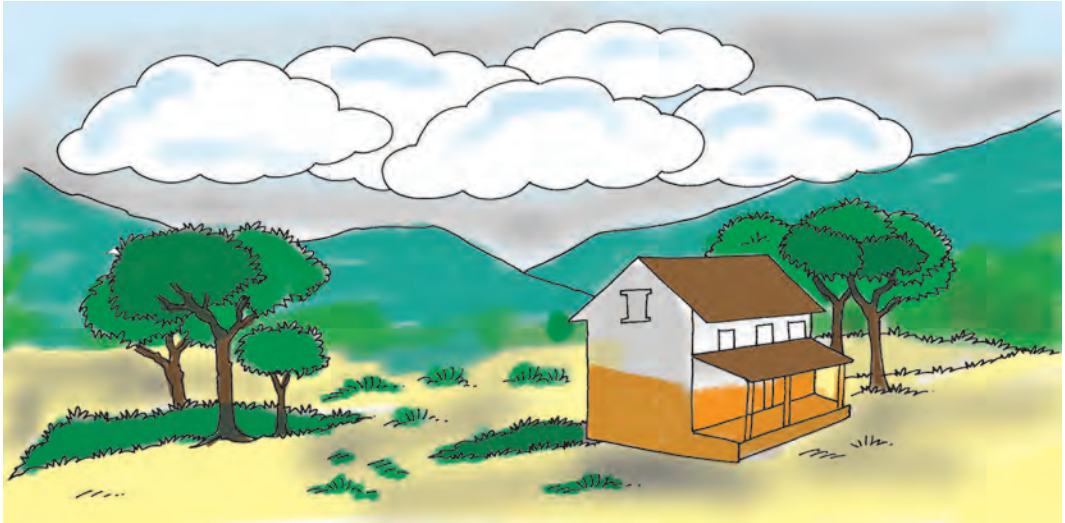
Weather

What is weather? What should be done to know the daily weather of your place or of around your school? Is the sky clean or cloudy? If cloudy, whether the cloud is light to block the Sun or is dark enough for rainfall? If it is raining, whether it is heavy rain or drizzling? If it is windy, what's the speed of the wind and in which direction is it moving? Observe today's weather and answer the questions given above.



You must have seen the situations that in one place it is sunny and in another place it is cloudy at the same time. Can you state its reason? Sometimes, it rains with sunshine and at other times it rains with storm. On a particular day, the sun is covered by the cloud and it starts raining. In this way, there occurs change in the state of sky, sun, rain, wind and temperature now and then in our locality. This type of change is called change in weather.

The condition of sun, rain, wind, temperature, humidity, etc. that get changed with in a short period of a time in a particular place is called weather. In contrast, climate means the aggregate form of temperature, humidity, atmospheric pressure, wind, rain and other atmospheric conditions. It remains for a long time in a particular place.



The weather of any place changes in different time even in a day. The weather of a place changes subsitantily in a week, in a month or in a year.

Activity 1

How does the weather get changed in a week during the time you go to school, during tiffin time and during the time you return home? Observe and prepare a record of each day as given in the following table.

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

Factors bringing change in weather and climate

The temperature of atmosphere frequently changes. The temperature is different at different times of a day: morning, afternoon and evening. When the temperature rises, we feel hot and when it decreases, we feel cold. The change in temperature of the Earth brings change in weather too. The Earth remains tilted at the angle of 66.50 on its axis and goes round the Sun in its egglike orbit. While the Earth is moving round the Sun, sometimes, the rays of the Sun come to the Earth straight while at other times, they come to the and earth diagnolly. Thus, the rays of the sun varies on the earth do not come to the earth uniformly. The intensity of heat and light of the sun on the earth sometimes is greater and sometimes lower. The place where the sunlight falls directly, the day is longer there. The heat and the light come to the earth for longer time and it is the hot season. Similarly, when the sunrays come to the earth diagnolly, the days are shorter. The heat and the light come to the earth for shorter time and it is cold season. In this way, the state of the sun and the earth brings differences in weather and climate. The following factors including the situation of the earth bring change in weather and climate.

Monsoon

The wind that carries the water vapour from the Bay of Bengal is called monsoon. This is responsible for the rainfall in South Asia. The wind causes heavy rainfall in Nepal. The monsoon starts in Nepal generally from the second week of Jestha, however, the climate change has brought change in the time of monsoon too.

Watercycle

The light and heat from the Sun changes the water of the Earth's surface into water vapour. The water vapour goes above and forms cloud when it becomes cooler. The water again comes back to the Earth in the form of rainfall. This cycle is called watercycle. Watercycle causes rainfall on the Earth.

Humidity

The amount of water vapour in the air is called humidity. Water goes into the atmosphere in the form of steam due to the heat of the Sun. This steam makes the air humid. The air containing greater amount of water vapour is called humid air and it is called dry air if the air contains lower amount of water vapour. When the humid air moves, rainfall occurs.

Weather forecasting

We all need to know the weather. The forecasting of weather helps everyone to prepare for their work in time.

What is weather forecasting? Have you heard the weather report read out at the end of a news bulletin on the radio? How is the forecast weather done? How is the weather at this time? Observe. The statement of the weather for future, by the observation of the weather in the past and at present, is called weather forecasting. The continuous observation of the weather of a particular place helps in forecasting the weather. The longer the time of the observation of the weather of a particular place, the more reliable the forecasting of weather will be. The following list contains simple methods for weather forecasting:

When there is scorching Sun from the morning in the monsoon season, it is likely to rain in the afternoon.

If the sky is partly cloudy from the morning, it is unlikely to rain throughout the day.

If the Sun gets scorching at once, it is likely to rain.

Storm is likely to occur if it is generally sunny.

If black cloud appears in the Sky at once, it is likely to rain.

If the cloud starts moving from West to East at the end of the monsoon season in our country, the rain stops after some days.

Meterology study centres have been established by setting up the instruments for measuring the factors of weather in different parts of our country. The information obtained from those centres helps us to know how the weather is changing, and this helps in forecasting the weather.

Nowadays weather forecasting is done by observing the condition and the speed of the cloud in the pictures taken by the satellites moving round the earth. Similarly, weather can be forecast on the basis of balloon and weather map. The forecast done in these ways is highly trustworthy.

Activity 2

Listen, read and watch the weather report on the radio, television and in the newspaper everyday at 7 am for a week. Observe the weather and make a note on the extent to which weather forecasts are trustworthy.

EXERCISE

1. Fill in the blank spaces with correct words.

a. The weather forecast made on the basis of ..... taken by satellite is more trustworthy.

b. Change in temperature brings change in..... of the Earth.

c. Weather is ..... from place to place.

d. When there is scorching Sun from the morning in the monsoon season, it is likely to ..... in the afternoon.

e. The light of the Sun does not always fall ..... on the Earth.

2. Write answers to the following questions.

a. What is called the weather?

b. List the factors that bring change in weather.

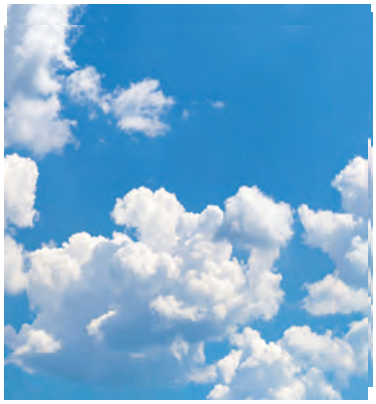
c. Why is it hot when the light of the Sun falls directly on the Earth?

d. What is weather forecasting?

e. What is the difference in humid air and dry air?

Lesson 11

Cloud



You must have seen the Sky covered with cloud.Observe the cloud blocking the sunlight, making the shade on the earth and the cloud in the sky during the rain. What difference do you find between them? How are such clouds of different shapes and sizes formed? Think over for sometime. The water from the pond, lake, river and ocean goes above in the air in the form of steam due to the heat of the Sun. The higher the water vapour reaches, it becomes cooler . When it becomes too cool, it changes into small drops of water. These small drops of water together form cloud.

The cloud seen in the sky is different in terms of its colour, shape and expansion. We will study the different types of cloud and their qualities.

Types of cloud

1. Cirrus

Cirrus cloud remains far above in the sky. This type of cloud is white, curly and thin. It looks like cotton spread in segments. Since it is found higher in the sky, it is very cold. It contains ice too. If it is seen in large amount in the sky, it is likely that rainfall with hailstones occurs.

2. Cumulus

Cumulus cloud is white and thick. Its upper part looks like a ball similar to the cauliflower and it is white. When the sunlight falls on it, the upper part looks bright and the lower part looks dark. This cloud blocks the sunlight and creates shade on the Earth. It rains when cumulus looks very dark. This type of cloud contains large amount of water. If cumulus becomes thick, lightening and thunder occur.

3. Stratus

Stratus looks like ash in terms of its colour. This type of cloud extends in the sky in thin layers. Very thin stratus near the land looks like fog. It can be seen in the early morning of an unwindy day and in the evening. It is calm when the stratus covers the sky. Thick stratus cloud causes drizzling for a long time.

4. Nimbus

Nimbus is dark brown and thick. This type of cloud remains lower than other types of cloud. This type of cloud does not have definite shape. The half of its lower part contains much water vapour. Downpours occur if it covers the sky thickly and bearing rainfall occur.

Activity

Observe the days when the sky is cloudy. Identify the different types of cloud as explained in the lesson.

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. The cloud that looks like fog is stratus. ( )

b. Cumulus cloud is found very high in the sky. ( )

c. Small drops of water in the water vapour together form cloud. ( )

d. The cloud found very low in the sky is brown in colour. ( )

2. Fill in the blanks with correct words.

a. The cloud which has greater amount of ice is .....

b. The water vapour becomes cooler in the atmosphere and form.....

c. The lower part of the stratus is.....

d. Nimbus is ..... in colour and causes rainfall.

3. Answer the following questions in short.

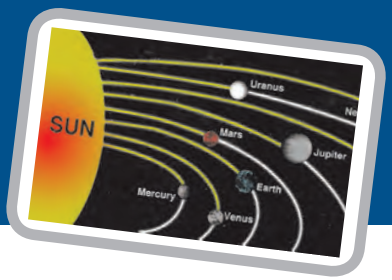
a. How is the cloud formed? write.

b. What type of cloud causes shadow on the Earth? Explain.

c. Give a short introduction of the cloud that causes lightening and thunder.

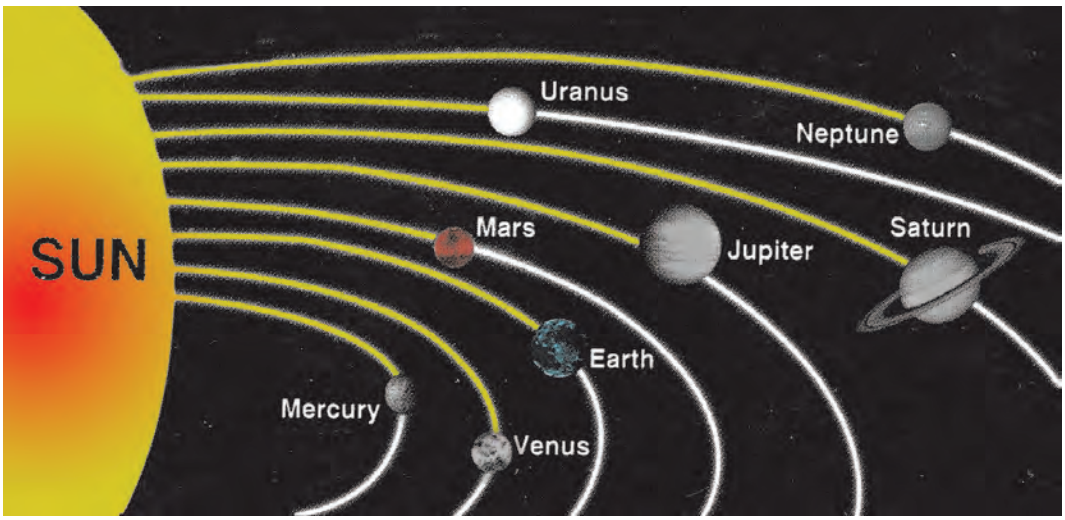
Lesson 12

The Solar System



The Sun and Solar System

The sun is a star that is nearest to us. The Sun is the ball of burning gases. The sun gives off light and heat in all the directions. We get heat and light from the sun.What would happen, if there was no Sun? Think. Humans, animals and plants get light and heat from the Sun. It helps to continue water cycle on the Earth. The



Sun is the primary source of energy. So, if there was no Sun, no living creatures including humans would remain alive.

The planets, satellites, the comet and other heavenly bodies that move around the Sun constitute the solar system. The sun is the prime member of the solar system. All other bodies move around the Sun.

Planet and star

The Sun has its own light so it is called the star. The heavenly bodies which move around the sun are called planets. The earth,

where we are living, is also a planet.The planets do not give off their own light but they appear bright in the sky. What might be the reason? Can you say? The planets reflect the light coming from the Sun so they look bright. The heavenly bodies that move round the planets are called satellites. The moon is the satellite of the Earth. There are eight planets in the solar system including the Earth. They are: Mecury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

All the planets go round the Sun in their fixed paths which are of egg shape. The path is called orbit. Each planet has its own orbit. Mercury is the closest to the Sun while Neptune is the farthest. Likewise, Jupiter is the biggest of them while Mercury is the smallest. Since the planets move round the Sun, their location keeps on changing among the stars in the sky. The Earth is the third planet from the sun. Only the earth has appropriate temperature, water and oxygen for creatures to live.Look at the clean sky at dark night. You can see numerous heavenly bodies. Some bodies are twinkling while some look bright continuously. The twinkling objects are stars and the objects that look bright are planets. Stars give off their own light while the planets do not have their own light. They reflect the light of the sun and look bright. At a quick glance, stars look like light points spread in the sky. They are very far from the earth so they look tiny. In fact, stars are the huge balls of very hot gases. So, they look like the burning Sun. Among the stars in the sky, the sun is one of them. It is the nearest star. So it looks big and bright. Some stars are thousands of times bigger than the sun. Planets are small heavenly bodies in comparison to the sun or stars.

Activity

1. The Venus is sometimes seen from the Earth at dusk (immediately after the sunset) in the western sky and at other times it is seen from the Earth at dawn (before sunrise) in the eastern sky. Observe and recognize.

2. With the help of teacher or the textbook, prepare a colourful chart of the solar system. Also label the planets.
3. Observe the heavenly bodies seen in the clear Sky at night. Identify the stars and the planets. What differences do you find between stars and planets? Fill in the following table and show it to your teacher.

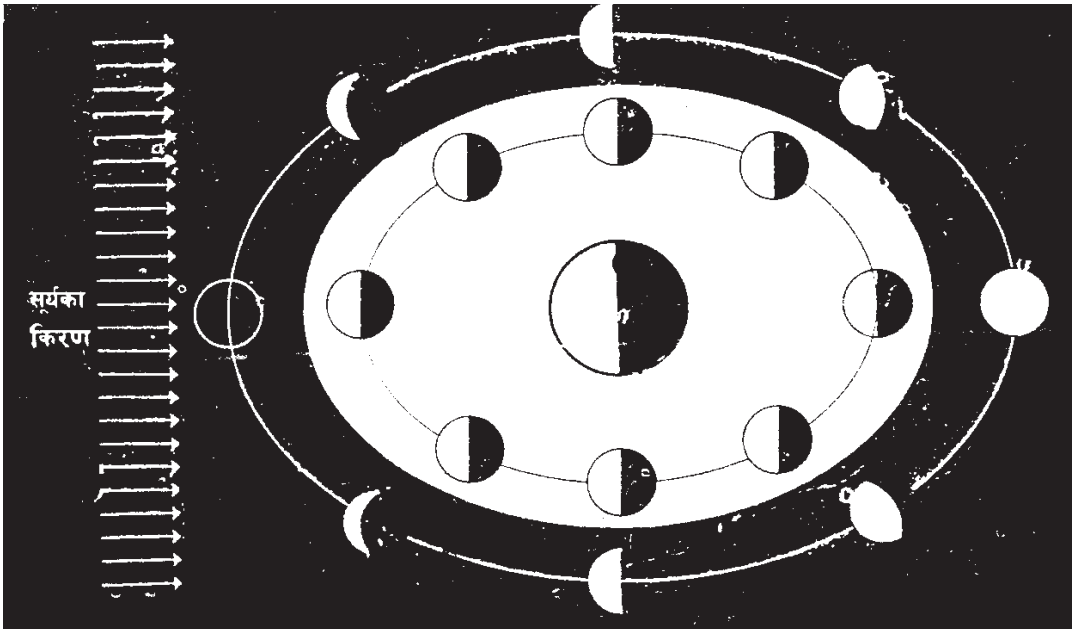
S.N.	Criteria of observation	Planets	Stars
1	Own light	No	Yes
2			
3			

Phases of the moon

You must have experienced the daily change in the shape of the moon. During the time when the moon is seen at night, the moon can be seen in different shapes each day. What might be the reason? On which day or in which condition can we see the full moon?

The moon does not have its own light.It reflects the light of the sun and looks bright. It is the only satellite of the earth. The Moon keeps on moving round the earth. In this movement, the moon happens to be between the sun and the earth at one time. At that time, the dark side of the moon happens to face the earth and thus we can not see the moon. This condition of the moon is called 'New Moon'. When the moon keeps on moving round the earth, the earth happens to be between the sun and the moon at another time. At that time, the bright side of the Moon can be seen from the earth. This condition of the moon is called 'Full Moon'.

How does the shape of the moon get changed? Observe everyday for a whole month. From the new moon day onwards, the bright

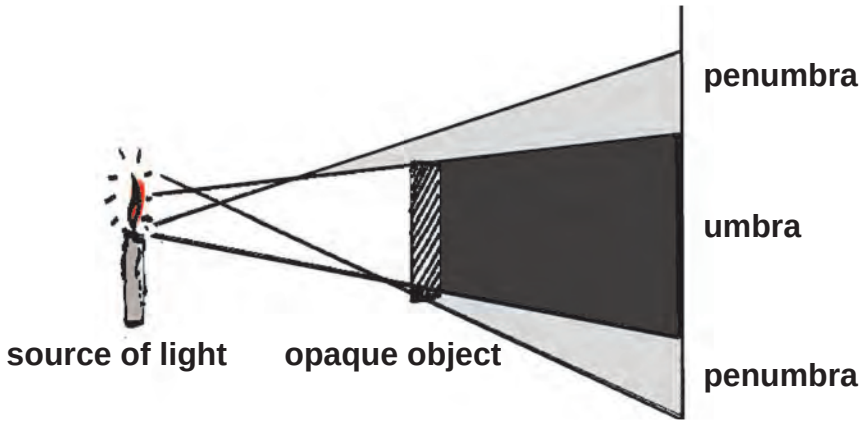


part of the Moon increases slowly and it is seen totally bright on the full moon day. This duration is called bright half. Similarly from the full moon day onwards, the bright part starts decreasing slowly and on the new moon day, the completely dark part of the moon faces the Earth and it cannot be seen. This duration is called dark half. In this way, the daily changing shapes of the moon are called phases of the moon.

The phases of the moon help in preparing the calender of each month. The duration between one new moon day and next new moon day or between one full moon day and next full moon day is of nearly a month. This duration is called a lunar month. (CHANDRAMAS).

Eclipse

The earth moves round the sun in its own orbit. Similarly the moon moves round the earth. In this process, sometimes the moon happens to be between the earth and the sun and sometimes the earth lies between the sun and the moon. Whenever, all these three bodies (the sun, the moon and the earth) lie in a straight line, eclipse occurs.



During the eclipse, the shadow of the earth and the moon falls on each other. So, before knowing about eclipse, let's discuss on what a shadow is.

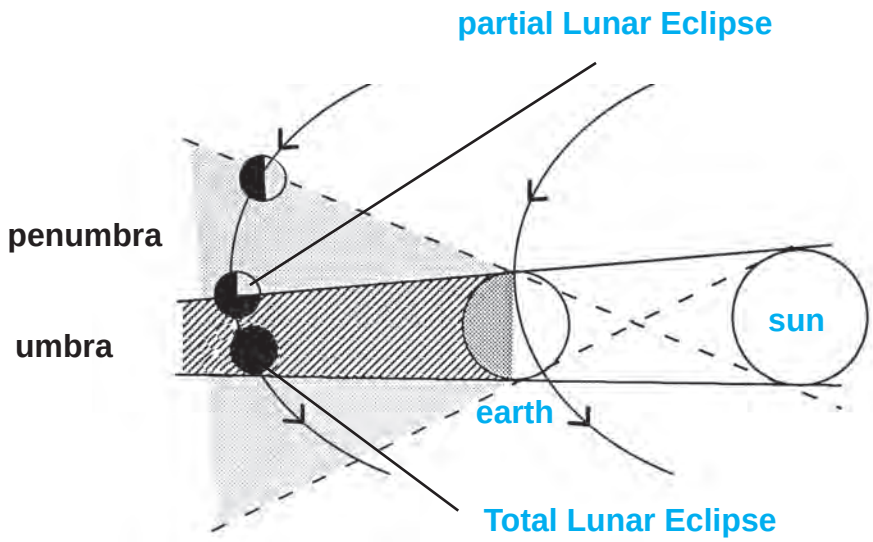
When the light falls on an opaque object, shadow occurs behind the object. This shadow is of two types. The dark shadow behind the object is called umbra. Outside the umbra, there occurs rarer shadow which is called penumbra.

Activity

Place an opaque object (book, exercise book, a piece of wood. etc) in front of the light of a candle in such a way that the shadow occurs on the wall. Look at the shadow on the wall and distinguish the umbra and the penumbra.

Lunar eclipse

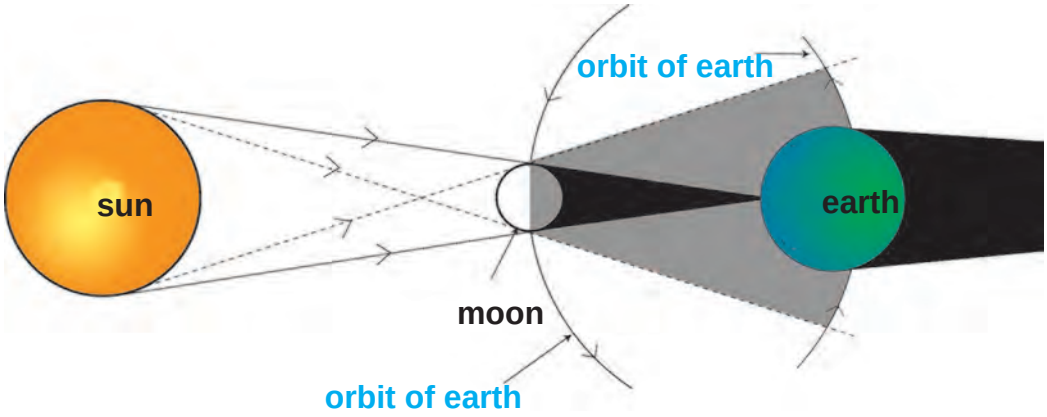
Lunar eclipse occurs when the sun, earth and moon appear exactly on the same straight line. In such situation, the earth blocks the sun's rays making dense and rarer shadow on the moon. If the dense shadow of the earth falls on the moon, the moon is totally shadowed. The eclipse occurred in that situation is called a total lunar eclipse. Similarly, if the moon is covered by the penumbra of the earth, only a portion of the moon is



shadowed. The eclipse occurred in that situation is called a partial eclipse. A lunar eclipse can only occur at the night of a full moon.

Solar eclipse

Solar eclipse occurs when the sun, earth and moon are aligned exactly on the same straight line with the moon in the middle. In such situation, the moon blocks the sun's rays making dense



and thin shadow on the earth. From the densely shadowed area of the earth, the sun is seen to be totally shadowed. The eclipse occurred in that situation is called a total solar eclipse. Similarly,

moon

from the rarer shadowed area of the earth, the Sun is seen to be partially shadowed. The eclipse occurred in that situation is called a partial solar eclipse. A solar eclipse can only occur during a new moon day.

Activity

Observe the bright part or the shape of the moon from one new moon to another new moon (nearly over a month) and make a note of how you perceive it. On the basis of your note, draw a figure of the moon too.

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. The moon is the satellite of the earth. ( )

b. The planets have their own light. ( )

c. The venus is the smallest planet of the solar system. ( )

d. Different creatures live on the earth. ( )

e. The process in which the bright portion of the moon increases or decreases is called the phases of the moon ( )

2. Match column 'A' with column 'B'.

Column 'A'	Column 'B'
a. Planet	( ) dark night
b. Jupiter	( ) moon
c. New Moon	( ) star
d. Satellite	( ) the largest planet
	( ) earth
	( ) full moon night

3. Fill in the blanks with correct words.

a. The solar system has ..... planets.

b. The heavenly bodies that moves round the planets are called.....

c. It takes nearly.....days for the earth to complete one circle by moving round the Sun.

d. The..... portion of the moon faces the earth on new moon day.

e. Stars have their..... light.

4. Answer the following questions.

a. What is the solar system?

b. Write the names of eight planets of the solar system.

c. What is phases of the moon?

d. How are the umbra and penumbra formed? Show it with a figure.

e. How is lunar eclipse seen? Explain with a figure.

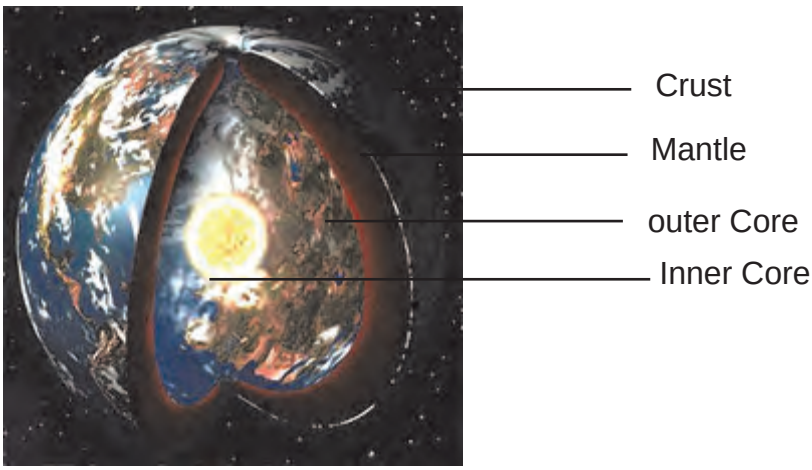
f. What are the differences between stars and planets ? Write any two differences.

5. Draw a neat labelled diagram of the solar eclipse.

Lesson 13

The Earth

If you look at a globe, you will find that the surface of the earth is made up of land and water. Three quarters of the earth's surface is occupied by the water and one fourth occupied by the land. In this way, there is more water and less land on the earth.The earth's surface is not similar everywhere. In some places, the land is plain whereas in other places, the surface of the land has risen to form hills and mountains. Similarly, there are valleys (plain land surrounded by the hills) as well as deserts. Did these types of earth's surface exist from the beginning? Think over this. The water part is also not similar like that of the land's surface. Pond, lake, river, sea, etc. are the parts of water.



The inner structure of the earth is different. As shown in the figure, the structure of the earth can be divided into three main parts. They are: the crust, the mantle and the core.

The crust

Crust is the outermost part of the earth. Its thickness is different from place to place. The crust can go as much as 75 km deep from the surface. It is the thin but hard layer made up of soil and rocks.

The mantle

The mantle is the layer between the crust and the core. Its thickness is about upto 2900 km. Although the temperature of the mantle is higher than that of the crust, the rocks are in the solid form. The mantle is made up of the mineral i.e. hard silicate.

The core

The innermost layer of the earth is the core. It is divided into two parts: outer core and inner core. The thickness of the outer core is about 2000 km. The outer core has iron, nickle etc. in liquid form. The inner core is upto 1360 km in its thickness. Due to the excessive pressure, iron, nickle, etc. are in solid form. The deeper we go inside from the earth's surface, the temperautre will be higher.

Activity 1

Make a model of the earth from the mud grape fruit or any or round object so that its inner structure can be shown clearly as given in this lesson.

Continuous change on the earth's surface

You must have seen the muddy water in the rivers during the rainfall in monsoon. Why has the water become muddy? Why

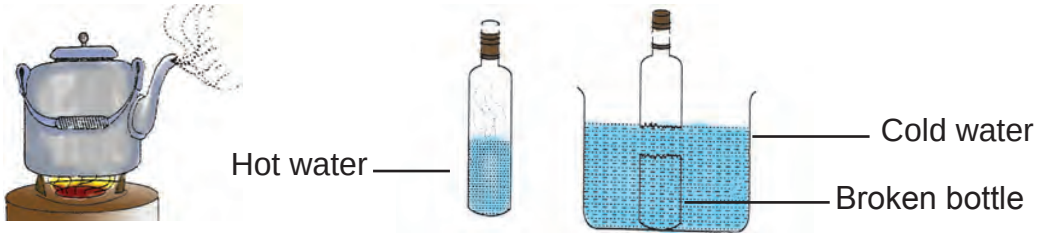
has the surface of benches been covered with a layer of dust during a long holiday? Have you thought about this? The rainfall during the monsoon season sweeps away the weak layer of soil from the surface of the land which causes the river water become muddy. The wind carries away the dust and the same dust stick on the surface of the benches in the classroom. In this way, the earth's surface occures due to the wind, water, temperature etc. The soil reaches another place and deposits. This is called soil erosion and deposition.

Different events occur on the surface of earth. The surface of earth is changing because of erision, deposition, flood, landslide, earthquake, etc. Therefore the surface of the earth was not like present days and it will not be the same in future. In this way there is continuous change on the surface of the earth.

Causes of change on the earth's surface

Activity 2

Take a kettle with some water and boil it as shown in the picture. Keep a beaker with cold water on the other side. Pour hot water into a glass bottle so that it is half-filled and keep the bottle in the cold water. Why does the bottle get broken? Write the reason.



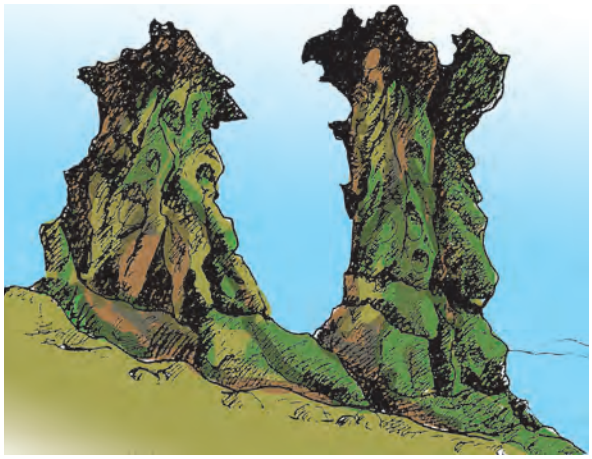
The temperature of the rocks increases during day due to the heat of the sun and they become cold during night. The rise and fall of the temperature causes the rocks expand and contract. When this process continues for a long time, the rocks become weak and get broken.

Activity 3

Collect some chalk powder and put it on the table so that everyone can see it. Spread a black plastic on the floor a little away. Now move thick paper left and right thick paper with your hand so that the chalk powder flies in the air. After some time, look at the plastic. What do you see? Think over its reason too.

The wind causes storm. The soil and the sand on the surface of the land fly in the air during storm. The soil and the sand make up a pile in another place. In this way, the strong wind causes weathering of the land and the rock.

You must have seen the flowing water during the rainfall in the monsoon. The water flows quickly in slope areas and slowly in plain areas. This way, the water carries away the soil of the slopy surface of the earth more than that of plain surface. The soil becomes loose because of the rain water in monsoon season. The river then carries away the rocks breaking them into pieces. The rocks while being carried away by the rivers strike with each other and change into small particles and finally pile up in plain areas. The river from the hills causes the rocks weather and get them piled up in plain areas.



People cut down trees of the forest indiscriminately. Continuous grazing of the cattle at a particular area causes the destruction of the plants. The soil of the land becomes loose and weak. Farming without terrace and the developmental works also make

the surface soil loose. When the surface soil becomes loose and weak, the monsoon rain carries away such soil. In this way, the earth's surface gets on changing because of temperature, wind, water and the animals.

Activity4

What types of earth's surface have you seen in your locality? Ask the elderly people whether those surfaces are like that from the beginning or they get develped later. On the basis of their reply write the causes of the change in the earth's surface.

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. The weathering of the earth's surface due to various causes is called soil erosion. ( )

b. Mantle is the thickest layer of the earth. ( )

c. The plain area surrounded by hills is called valley. ( )

d. The rivers cause the weathering of rocks and carry them away to make a pile in plain area. ( )

e. Farming without terrace in slopes causes soil erosion in greater quantity. ( )

2. Fill in the blank spaces with correct words.

a. The monsoon rain makes the soil of the land.....

b. The causes of the change in the earth's surface are: wind,

water, animals and.....

c. The monsoon water carries away the surface soil of .....more easily than that of plain area.

d. The rise and fall of the temperature causes ..... of rocks.

3 Answer the following questions.

a. How does the earth's surface get changed during rainfall?

b. Write the names of minerals found in the inner core of the earth.

c. What are the main causes of the change in the earth's surface?

d. What is soil erosion and deposition?

e. How does the heat of the sun cause change in the earth's surface? Explain.

Lesson 14

Information and Communication

The collection of statistics and knowledge on any subject is called information. The transmission of such information from one place to another is called communication. We can obtain information from book, newspapers and electronic media. The sources from which we obtain information are called sources of information. We can use different sources for different information. For example, if we need the information of incidence occurred at a particular time, we should refer to the notice or materials published at that time. The information collected by us can be transmitted through radio, television, telephone, newspapers, gathering, and workshop or through electronic media. In this way, communication can be divided into different types.

Types of sources of information

Sources of information can be divided into different types. They are:

a. Book and periodic publication

b. Reference materials and general collection

c. Print materials and electronic materials

a. Book and periodic publication

Written information can be divided into two types: book and periodic publication. A book is published by collecting the facts and the information of different times in a single volume.

Periodic publications are published at a particular interval of time. Newspapers, magazines, etc. are periodic publications. These publications have their definite use. We read newspapers to have an idea of present situation.

b. Reference materials and general collection

While writing an article or a book, we need to collect information from different sources. Those sources are called reference materials. It is better to depend mainly on the primary sources like: journal, newspapers, etc. for reference materials. Reference materials give us the knowledge of the location from where we have collected the information.

We can collect information from different sources in a single book. These sources are read for general understanding rather than as reference materials. So, a book is the general collection of different types of information.

c. Print materials and electronic materials

Books, newspapers, and the library materials are print materials whereas the information found on the internet including e-book, e-journal and database are the electronic materials. Nowadays, electronic materials are used for obtaining quick information. Both print and electronic materials are used on the basis of the need of information.

Types of communication

People talk to each other. Some informations have such nature that they need to be reached to the general public at the same time. For this, radio and television are used. The process of sending information or message from person to person and from place to place is called communication. As the ways of transmission of information are different, their types are also different. The types of communication are dealt briefly in this lesson.

a. Intrapersonal communication
b. Interpersonal communication
c. Mass communication

a. Intrapersonal communication

Communication takes place in self while we are thinking over

something or trying to solve a problem. Let's take an example: suppose you have a T-shirt in one hand a shirt in another hand. What will be your response? You may say that the shirt is more beautiful than the T-shirt. In such situation communication takes place between eyes and mind. A single person is both the sender and receiver of communication in intrapersonal communication. This is a two-way communication system.

b. Interpersonal communication

You demand with your parents if you need a pen or an exercise book. Your parents may say 'yes' or 'no' as a response. You yourself may talk with your friends over the telephone or mobile. This type of communication is called interpersonal communication. In this type of communication, the speaker and the receiver are well known to each other or at least they can recognize each other. Face to face talking, interview, etc. are the examples of interpersonal communication. This is a two-way communication system.

c. Mass communication

You may have the habit of listening to the radio or watching television. Information is transmitted by the radio or the television to the common mass of the people at the same time. This type of communication is called mass communication. This is a one-way communication system.

Computer as a means of communication

Nowadays the use of computer has tremendously increased. Computer is also an important means of communication. The computer has three main parts: (a) CPU (Central Processing Unit), (b) monitor and (c) keyboard/mouse.

Keyboard and mouse are used to give commands/input to the computer. Likewise, the command/input is processed by CPU making it meaningful. This is also called the brain of a computer. Information is displayed on monitor. The information can be printed, recorded or transferred. Computer can function as

a means of communication only when it is connected to the network. We should contact at the telecommunication office for networking. Internet can be browsed on the computer by connecting the telephone line. Written message can be both sent and received (e-mail) through the internet. With the help

of the internet, we can search the required information on the websites. Similarly, we can upload the information which we like to share with others on the website. With the help of the computer, we can send and receive spoken or written messages to the friend who is online in another place. This is called chatting. Nowadays, people from different places can talk as if they are having discussion sitting at the same table with the help of the computer. This is called video conference.

Aero-plane, ship, submarine or rockets can be controlled and administered from a particular station with the help of the computer. In this way, computer has become an important means of communication.

Teaching Instructions

Collect the different sources of information and display them to the students. If possible, demonstrate or ask them to do chatting or searching the website.

Activity

Write names of any two books and any two periodic publications. Write any two types of information that can be obtained from each of them.

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. Periodic publications are published at a fixed interval of time. ( )

b. The sources of information that are collected for writing an article are called reference materials. ( )

c. The transmission of information takes place within the same individual in interpersonal communication. ( )

d. Mass communication is a one-way communication system ( )

2. Fill in the blanks with correct words.

a. The communication that takes place within the self is called..... communication.

b. Newspapers are..... publications.

c. We can collect information from....., newspapers,

d. Computer can function as a means of communication only when it is connected to the .....

3. Write short answers to the following questions.

a. Write the difference between reference materials and general collection.

b. How does information flow take place in intrapersonal communication?

c. How can the computer function as a means of communication ?

Lesson 15

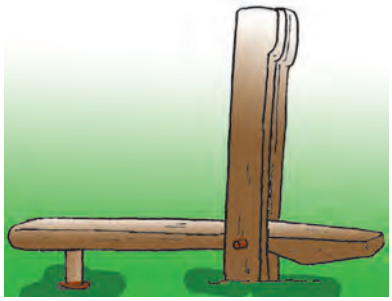
Simple Local Technologies

We have been using different technologies in our villages to simplify our daily activities from the very beginning. Dhiki and Stone grinding mill (Janto) are used for pounding and grinding. Hand mill for squeezing and pressing the juicy item have also been in use. In the process of bringing timely changes in traditional technologies, improved earthern stove has replaced traditional earthern stove. In this lesson, we will discuss the general introduction to these technologies and their uses.

A. Dhiki and stone grinding mill (Janto)

Dhiki and stone grinding mills (Janto) have been found in use before the use of modern machines for pounding and grinding.

Dhiki



Dhiki has been in use from the very beginning for pounding paddy and for making beaten rice. It is made up of a long log of wood which is about 2 metres in length, 15 cm in breadth and 10 cm thick/high. The tail of a Dhiki is made flat to keep the feet to raise it. At the one third parts from the tail of the log, a wooden bar (Aaglo) is kept crosswise on the pillars on both sides so that the Dhiki is between them. The Dhiki has a pestle on the middle

part of the front of the log. The pestle has a cylindrical metal plate with teeth like a saw attached to it. The pestle is kept/made in such a way that it falls in the mortar (a stone with a hole on it). While pounding grains, the tail (shorter end of the Dhiki behind the wooden pillars) is pressed with a foot to raise the front part (that has pestle). When the leg is detached, the front part goes down and the pestle falls on the grains in the mortar. The frequent repetition of the process causes pounding of grains.

Stone grinding mill (Janto)

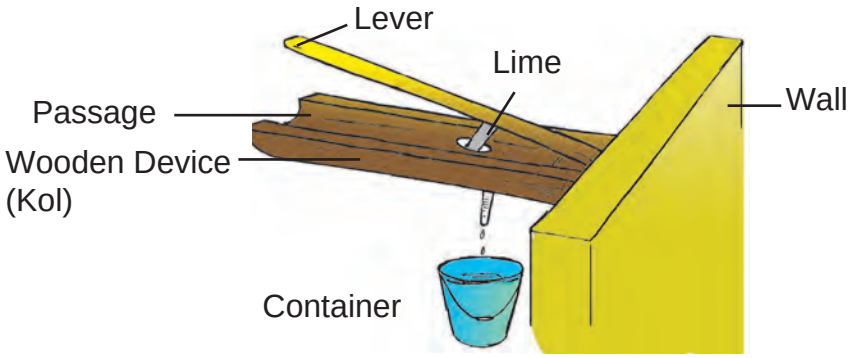
Stone grinding mill is a traditional tool used for grinding. It has two stone wheels, a wooden stick (called handle) and a small iron nail (pivot).

The lower stone wheel is buried under the ground so that the upper part of it is a little above the surface of the floor which has a pivot inserted in it. This stone wheel is immovable. The upper wheel has a small hole in its middle and on its edge; there is a small hole to insert the handle. The upper wheel is kept facing down (with the handle above) in such a way that the pivot comes through the hole of the upper wheel. While grinding, the grains are put in the hole and the upper wheel is moved round with the help of the handle. While moving the upper stone this way, the grounded grain comes out of the part between the wheels.

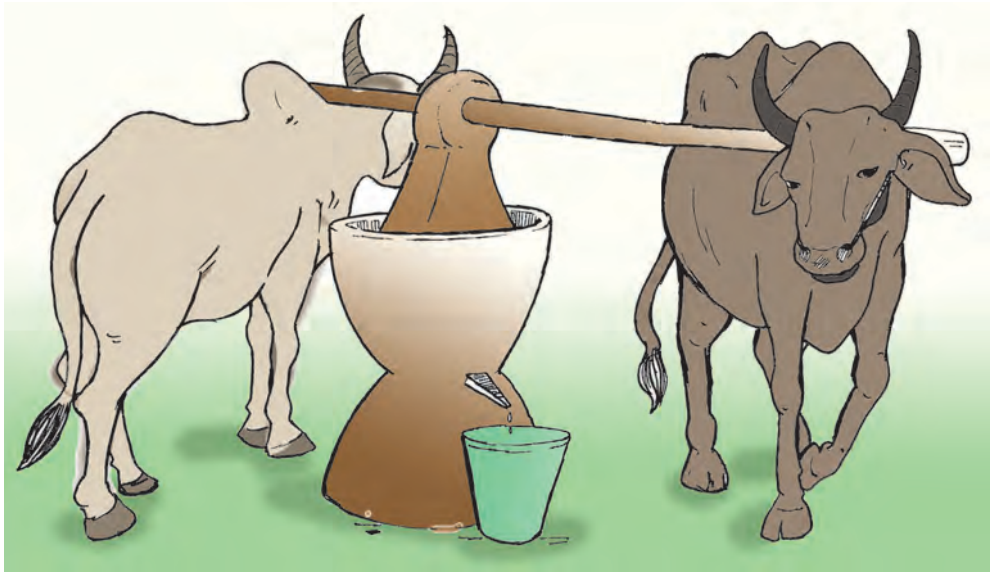
B. Hand mill (Kol)

Hand mill is used to squeeze and press juicy and sour fruits (lemon, citron, shaddock etc.), sugarcane and mustard. The structure of hand mills is different, however, all of them are based on the same theory. If juicy items are pressed heavily, they get squeezed and the juice comes out. The hand mill is based on the same operational theory.The structure lemon/citron sueezing

hand mill is like that shown in the picture. A long ditch is made along a flat piece of wood and on its one end, there is a hole. At the outer end of the hole, there is a small piece of wood to keep



the pressing stick stable. This type of hand mill is diagnolly pierced on the wall. The citron to be squeezed is put on the ditch and pressed with a pressing stick from above. The force put at the upper end of the pressing stick causes the fruit squeezed and the juice comes out. The juice goes down through the hole. The juice is then collected and boiled.



The structure of mustard squeezing hand mill is like that shown in the picture. The structure of this mill is different from that used

to squeeze sugarcane. However it is rotated in the same way as the sugarcane squeezing mill. A piece of log is kept horizontally in the pestle. Having kept the mustard in the mill, the horizontal log is moved round from its two ends inside the pestle.This process causes the mustard squeeze by pivot. As the mustard is pressed, the oil begins to come. The oil then is collected in a bucket through a hole of the mill. Because heavy pressure is required to squeezes the mustard, we use a pair of oxen to move the pestle round. The mill is used to squeeze mustard and linseed to get oil. The remains after squeezing the oil is called oil cake which can be used as fertilizer in the field.

The structure of the mill for squeezing sugarcane is like that of mustard squeezing mill. The sugarcane sticks, either wholly or in pieces, are put in the mill from the side of the pestle. By making the pestle sloppy, it is drowned in the mill. Then the pestle is moved round with the help of the handle connected from outside to the pestle. This high pressure falls on the sugarcane and the juice comes from them. The juice comes out of the mill through a small hole and collected in a bucket. People make molasses and brown sugar out of the sugarcane juice.

C. Improved earthern oven

People have been using firewood for preparing food in rural areas. Traditional earthern oven has been used to burn the firewood. Such traditional earthern oven has some weaknesses, for example: it requires much fuel, i.e., firewood, it produces much smoke; it has the possibility of fire as firewood is burnt openly, etc. Improvement is required in such earthern stove because of these weaknesses. In traditional earthern oven, fire need s to reach to the both mouths but in improved earthern oven, there is a flat piece of iron between the first and the second

mouths. The surplus heat from the first mouth of the oven gets the iron plate heated and the heat causes the air upto the second mouth hot.

Similarly, the hot smoke from the burning firewood also goes to the second mouth. The food on the second mouth of the oven is cooked with the heat. This way, improved earthern stove saves fuel. The surplus hot air/smoke goes out of the house through the chimney kept ahead of the second mouth.

Thus, improved earthern stove helps in proper use of fuel. The smoke goes out of the house through the chimney and we can be safe from the bad effects of smoke in our health.

Teaching Instructions

Take your students to a short tour to show them Dhiki, stone grinding mill (Janto), hand mill and imroved earthern stove. Let them observe these technologies as many as possible. Ask your students to state what they know about them.

Activity

How do people use Dhiki and stone grinding mill (Janto) for pounding and grinding? Write. Write in short about the pounding and gridning technologies other than Dhiki and stone grinding mill (Janto) if you have them in your locality.

EXERCISE

1. Put a tick (√) if the statements is correct and a cross (×) if it is wrong.

a. People use stone grinding mill (Janto) for grinding. ( )

b. Mustard squeezing mill and sugarcane squeezing mill have difference in their theory. ( )

c. Traditional earthern stove is better than the improved earthern stove from the perspective of health. ( )

d. People use Dhiki for pounding. ( )

2. Fill in the blanks with correct words.

a. A wooden stick that is used for moving the upper stone wheel of stone ginding mill is called ……..

b. In improved earthern stove, the surplus smoke goes out of the house through……

c. High ……causes the juice in juicy fruits comes out.

d. ……. is used as fuel to cook food in earthern stove.

3. Answer the following questions in short.

a. Write the operational theory of hand mill.

b. How do we use the sugarcane juice?

c. Why does traditional earthern stove need improvement?

d. How does improved earthern stove help in proper use of power?

e. Write the structure of stone grinding mill in short .

4. Make a clear picture of Dhiki.

Health Education

Lesson 1

Personal Cleanliness

Cleanliness of different parts of body

Anything done for keeping the body clean and healthy is called personal cleanliness. Different diseases may attack us when we ignore in personal cleanliness. We should adopt healthy habits and behaviour to keep our health in good condition. Personal cleanliness includes the cleaning of hair, nose, mouth, eyes, ears, skin, sex organs, etc.

Ways of cleaning the different parts of body

Our body is made up of head, body, hands, legs, etc. together. Nose, mouth, eyes, etc. are the parts of face. These organs are in contact with daily environment and have the possibility of being dirty. So, we should keep these organs clean.

Regular bathing is necessary to keep the body clean. It protects our head from dandruff and lice. We can be safe from several diseases if we wash our hands properly with soap after toilet. While washing the face, we should also wash our nose and eyes properly. If the eyes are not kept clean, they may have eye wax which may lead to the eye diseases in the future. Similarly, a soft handkerchief soaked with clean water should be used to clean our nose. While cleaning our eyes, clean water should be splashed keeping them open.

We use our mouth to speak and to eat something. Teeth are used to chew food. The pieces of food we eat get stuck in or between the two teeth. If we do not brush our teeth properly, the stuck food gets rotten and causes the stinking of mouth, swelling of gum and toothache. We should brush our teeth properly with a smooth toothbrush moving it up and down twice a day after

each meal. After eating sweet food, we should clean our mouth with water. The use of flouride toothpaste helps in making the teeth strong.

We should take bath for keeping our body clean. The bathing helps us to keep the outer part of our body clean. Making the skin clean keeps us away from skin diseases like: itching and skin ulcer. While cleaning our body, we should clean our excretion organs too. The organ that excretes urine is called urinary organ or reproductive organ. The urinary organ is tender in comparison with other organs. These organs excerte the inner wastes of the body. These organs are covered almost all the time so they should be cleaned with soap and water properly.

Our hands and legs are the organs that are moved more. Eating with dirty hands may cause stomach ache, diarrhoea etc.We should wash our hands properly with soap or ash and water properly after and before meal, after touching dirty things, after playing games and after toilet. While washing the hands, the nails should also be cleaned. We should rub properly between the fingers, too.

Our age goes on increasing everyday. We enter old age passing through different stages: infancy, babyhood, puberty, etc. There occur several physical and mental changes at different stages. With physical changes menstruation occurs in girls. This happens with all the girls at certain age. Since this is a natural process, the girls should not hesitate or be afraid of consulting with their mothers or elder sisters. During menstruation, the sex organ should be washed with clean water and the soft cotton pad

should be used. The pad absorbs the dirty blood. The food to be eaten during the time should be nutrituous and should contain minerals. More attention on cleanliness should be given during menstruation.

Activity

1. Be divided into five different groups (Teeth, Eyes, Nose, Hair and Hand). Work in groups and write the ways of cleaning the organ (which is assigned to your group) and present it to the whole class.
2. Be divided into different groups. Demonstrate washing your hands properly.

Teaching Instructions

Teach this lesson focusing on the problems that can occur in body if the personal cleanliness is ignored. Try your best to create easiness among the students while telling them the changes that occur when boys and girls enter puberty. Demonstrate the correct way of brushing the teeth. Also ask your students to brush their teeth accordingly.

EXERCISE

1. Match the organs in column 'A' with their functions in column 'B'.

Group 'A' Organs		Group 'B' Functions
(a)	Teeth	( ) helps to smell.
(b)	Eyes	( ) help to digest food.
(c)	Ears	( ) helps to see.
(d)	Nose	( ) should be brushed twice a day.
		( ) helps to listen.

2. Put a tick (√) if the statements is correct and a cross (×) if it is wrong:

a. We should rub our eyes if dust falls in it.

b. We should brush our teeth only when we have a toothache.

c. The skin should be cleaned properly.

d. Menstruation does not occur in boys.

e. We should not keep our nails long.

3. Write answers to the following questions:

a. Write names of any five organs of our body.

b. What happens when the hair becomes dirty?

c. Write the ways to clean the teeth.

d. What are the things to be considered during menstruation?

e. What happens if we do not clean our nails?

Health Slogan

Let's clean organs of body everyday,
save and be safe from diseases.

Lesson 2

Physical exercise, rest and sleep

Physical exercise, rest and sleep

We all like to maintain our body clean, attractive and healthy. Healthy habits and behaviour are mandatory for being healthy. Regular exercise, rest and sleep including the cleanliness of body are required to make a person healthy. Safe and balanced diet and putting on the clothes according to the weather are the healthy habits to be adopted to be healthy.

Importance of physical exercise

The frequent moving of different parts of body in balanced way is called physical exercise. Physical exercise helps to make the body organs well-nourished and strong. For this, we need to take part in simple games and in physical exercise organized at school. Physical exercise and games develop the qualities like: cooperation to each other, living in group etc. Games and physical exercise, balanced diet and rest are to be done as per the necessity. Taking rest helps the organs of body giving freedom from tiredness. All the people should do physical exercise regularly according to their age. Physical exercise helps in increasing the digestive power which in turn helps to increase appetite to make the body strong and for proper sleep.

Regualr rest and sleep

Have you seen the machines in factories? A machine cannot function if one of its parts goes wrong. Our body is also like a machine. We become unhealthy when one of the body parts goes wrong. So, all the organs require regular exercise and rest. Elderly people and children require more rest whereas less rest is enough for adults. Sound sleep is necessary to give the body full rest.

We should sleep with our legs stretched and without covering our face. We should sleep 8 to 10 hours daily in general. We should develop the habit of sleeping early in the evening and getting up early in the morning. To have a sound sleep, the bed room should be non-nosiy and well ventilated so that the air can pass freely. Taking rest helps in proper digestion of food. It also helps to be free from tiredness and it increases thinking power too.

Teaching Instruction

Teach focusing on the lifeskills that help the students to develop habits to lead a healthy life.Give behavioural examples of balanced diet, regular rest and exercise. Give more rationales behind the necessity of rest and exercise.

Activity

Why does our body need exercise, rest and sleep? Discuss and make a list of the reasons behind their requirement and present it to the class.

EXERCISE

1. Complete the following sentences choosing the correct word from the brackets.

a. We need regular..... for being healthy. (sleep, diet, exercise)

b. We should eat..... for keeping our body healthy. (corn/soyabean/vegetables, balanced diet)

c. Bed room should be clean, well ventilated and ..... (cold, dark, silent)

2. Answer the following questions.

a. What four things are needed for an individual to be healthy? Write.

b. Write any four advantages of physical exercise.

c. What advantage does the body get from exercise and rest?

Health Slogan

'Let's have regular exercise and rest,
let's learn to live a healthy life.'

Lesson 3

Need of Environmental Cleanliness

Krishnamaya Lama and Hareram Chaudhary are best friends. They study at the same school.Their teacher taught the lesson 'Need of Environmental Cleanliness' the previous day. They are on the way discussing the lesson.

Hareram Chaudhary : Do you know what an environment is, Krishnamaya?

Krishnamaya Lama : As far as I know, environment is the condition of the rivers, forest, road, birds, animals, houses, schools around us. It is the combined form of living and non-living things. So, the teacher told us

that cleanliness of environment is to be given special attention.

Hareram Chaudhary : What have we done to environment? And, why do we need to be attentive to environmental cleanliness?

Krishnamaya Lama : I have thought in that way too but in fact, that is not the truth. Whatever we do from the time we get up in the morning is connected to the environment. We don't understand the thing and we are spoiling the environment.

Hareram Chaudhary : How? I don't understand.

Krishnamaya Lama : My grandfather has told me that our village was not so dirty in the past as it is now. There used to be a forest near the village. The forest used to contain lots of trees and there used to be no scarcity of grass and firewood. There used to be enough sources of water. There used to be no shop and no plastic. (interrupted in the middle)

Hareram Chaudhary : What are you saying? Do you mean that environment is spoilt by the development, construction and facilities?

Krishnamay Lama : It is not better to interrupt in the middle without understanding. Listen! I'm not saying that we should not take benefits from development. I'm saying that during the process of development, environment should be kept clean

and in balance. While setting up the water tap, the drainage should also be built. Empty areas are to be planted with trees. Plastic bags should not be thrown everywhere; they should be kept at a particular place so that it won't be dirty like it is now. Apart from this, environment pollution starts together with development. If we do not do the works of environmental cleanliness, it will become a problem in future. He has told me.

Hareram Chaudhary : What type of problem?

Krishnamaya Lama : Health problem is the biggest fact. Throwing away the litters everywhere leads to the spread of bad smell in the environment. There is the increase of germs in such places which can cause different diseases among the people living around and the people walking past. You must have rememberd what the teacher told us in yesterday's class.

Hareram Chaudhary : What?

Krishnamaya Lama : The environment around us is mainly responsible for being affected by diseases. If the environment is healthy, fresh and clean, our health will also be good. So, we must pay attention to the balance and cleanliness of environment. Didn't the teacher tell us that it's our duty to keep the environment clean and balanced?

Hareram Chaudhary : Really? We suffer from diseases if the enviroment is dirty, don't we?

Krishnamaya Lama : Yes. Environmental balance and cleanliness are very important for us to be healthy.

Hareram Chaudhary : I realize that I have not understood many things yet. From now onwards I will also deliver the messages to my family members and the people living in our community that daily household wastes should not be thrown everywhere. They should be collected in a pit or put in the container nearby. I will try to make the people aware that it is the duty of all of us to keep the environment clean, fresh and balanced.

(They arrive at the juction and follow the paths to their homes)

Teaching Instruction

Teach focusing on the concept of environment and the importance of environmental cleanliness. Teach focusing on the lifeskills that can change their wrong concept and behaviour regarding the environment. Also observe their behaviour from time to time. Teach them the skill based knowledge that students have important role in the management of wastes. Ask the students to role play the lessons as far as possible.

Health Slogan

'It's the duty of all of us to keep the environment clean and fresh.'

Activity

Go around your neighbourhood. Find out what activities at your neighbourhood people do tht can cause pollution in the environment. How can you help to stop the pollution? Work in groups to fill in the following table and present it to the class.

EXERCISE

1. Put a tick (√) if the statements is correct and a cross (×) if it is wrong.

a. Living and non-living things together form the environment.

b. We are not likely to be affected by diseases when the environment is dirty.

c. The environment of our house becomes polluted if we leave our house dirty.

d. It is the duty of all of us to keep the environment clean.

e. The household wastes should be kept in a container.

2. Write answers to the following questions.

a. What is called environment?

b. Why do we need to clean the environment? Write any three reasons.

c. What things are to be done to manage the wastes increased together with developmental works?

Lesson 4

Solid Wastes

We use different things at our home. The remains of used things to be thrown are called wastage. The wastage when we throw comes into contact with other things and changes into garbage. Such garbage comes from room, house, shop, factories, school, etc. Solid waste can be divided into two types: decaying wastes (bio- degradable) and non-decaying wastes (non bio- degradable) .

a. Bio-degradable wastes

The wastes that decay are also called biodegradable wastes. Withered plants and weeds, dead animals, remains of vegetables, etc. are the decaying wastes. Similarly, paper, pieces of wood, useless clothes, leather, torn straw mats, jute bags, etc. also fall in bio-degradable wastes. These wastes decay and get changed into soil.

b. Non-biodegradable wastes

The wastes that do not decay are also called non-biodegradable wastes. This type includes plastic, glass, pieces of metal objects etc. The increase in such wastes has worsened the problem of wastes. We should know and learn the ways for the management of wastes to reach the solution of non-decaying wastes. There are several ways of waste management. For example: minimizing waste, reuse of the objects or recycling them.

Earning from wastes/coins from wastes

For the management of wastes, we should sort out the wastes into: decaying and non-decaying (biodegradable and non-biodegradable) wastes. Among the non-decaying (non-biodegradable) too; plastic, metals (iron, copper, aluminium etc.) and glass bottles are to be kept separately. These can be recycled and new objects can be made, so we can sell them to the waste collector.

Decaying (degradable) wastes, if thrown elsewhere, bad smell will spread in the environment. The degradable wastes can be used to make compost fertilizer. For this, a ditch can be made a little farther from the house so that we can collect the decaying objects there. The wastes in the ditch should be covered with plastic so that they can be protected from rain. All the biodegradable wastes should be collected there. The wastes there should be stirred from time to time. After few weeks, the wastes get changed into compost fertilizer. Such fertilizer increases the fertility of soil and helps to keep environment clean and healthy. The vegetables and cereal crops produced by using compost fertilizer are beneficial for our health.

Teaching Instruction

Teach this lesson focusing on the methods of producing less wastes and their management. Teach this lesson focusing so as to develop of life skills on the part of the students necessary for maintaining the clean environment at home, school and community. Ask the students to manage the wastes around so that they can get experimental knowledge and skill.

Activity

What wastes are produced at home, schools and shops? Make different lists of biodegradable and non-biodegradable wastes.

EXERCISE

1. Put a tick (√) if the statements is correct and a cross (×) if it is wrong.

a. The water that comes while washing dishes is solid waste.

b. Biodegradable wastes decay immediately.

c. Compost fertilizer can be made from decaying things.

d. Plastic is non-decaying waste.

e. Compost fertilizer is good for vegetable farming.

2. Match column 'A' with column 'B'.

Column 'A'	Column 'B'
(a) Weeds	( ) re-useable
(b) Waste	( ) does not decay
(c) Glass bottle	( ) is decaying waste
(d) Iron	( ) pollutes the environment.
	( ) can be made compost fertilizer

3. Write answers to the following questions.

a. What is called solid waste?

b. Write the names of any five wastes produced at school.

c. How does the environment is get littered? Mention any two causes.

d. How is compost fertilizer made?

Lesson 5

Balanced Diet

Our body becomes healthy, if the food we eat is clean and balanced. Eating unhealthy and unbalanced diet increases the possibility of being attacked by diseases. We eat pulses, rice, vegetables, seeds etc. every day in the morning and evening. We may not obtain all the nutrients required for our body from them. So, we should eat the food that contains the nutrients required for our body. The required amount of the type of food to be eaten for a balanced diet is determined by the nutrients found in the food. The food which contains nutrients in the right proportion is a balanced diet. In other words, the food that contains carbohydrate, protein, vitamins, fat, mineral and water in the right amount as per the requirement of the body is called a balanced diet. Our daily diet should contain the following nutrients:

Carbohydrates: rice, maize, wheat, barley, buckwheat, millet, potatoes, sweet food, etc.

Protein:	pulse, broad beans, green beans, nuts, soybean, cashew, milk, cheese, fish, meat, curd, egg, etc.
Fat:	oil, ghee, meat, etc.
Minerals:	all types of leafy vegetables, stinging nettle, spinach, dry vegetables (gundruk), arum lily, corriander leaves, fruits, etc.
Vitamins:	papaya, mango, apple, guava, orange, banana, lemon, pomegranate, green vegetables, fish and meat, non-polished rice, germinated seeds, etc.
Water:	clean drinking water.

Attention to be paid while preparing a balanced diet

Among the foods divided into different groups, carbohydrates and fat give energy to body, protein helps in body building; and minerals and vitamins protect our body. For the preparation of a balanced diet, the above mentioned food stuff is to be divided into six groups: cereals, fruits and vegetables, pulse and seeds, milk and milk related food, meat and eggs, liquid and others. The nutrients required for food can be obtained by eating all these six types of nutrients in right amount. Pregnant woman need to eat in extra amount the lentils, the beans, fish and meat. Children, elderly people, youths, pregnant woman, irrespective of their age and condition need to eat nutritious food to be protected from malnutrition.

Teaching Instructions:

While teaching, focus the content on the food stuff available in different communities.Divide the class into groups to divide the food stuff according to the nutrients found in them. Also ask to display their work.

Activity

1. What food have you and your friends eaten in the morning? Make a list in group. Prepare a table according to the nutrients found in them.
2. Whether any of the nutrients became less in the food you eat or not, discuss with your friends.

EXERCISE

1. Complete the following sentences choosing the right word from the brackets.

a. We should always eat..... (balanced diet, diet containing proteins, diet containing vitamins)

b. ..... is found in rice. (Minerals, Carbohydrates, Fat)

c. Balanced diet makes our body..... (healthy, weak, fat)

d. Children and pregnant woman should always eat..... food. (nutritious, much, only one kind of)

2. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. We should eat one kind of food all the time.

b. Vitamins protect us from diseases.

c. People of all age group and condition should eat only one kind of food.

3. Answer the following questions.

a. What type of diet is called balanced diet?

b. Prepare the list of food that gives energy to body.

c. Write any five food stuff found in our countryside.

Lesson 6

Causes of Malnutrition and Preventive Measures

In our society, fat people are generally considered to be healthy and thin to be weak and unhealthy. Health education does not consider both these situations as good. Health education tells us that the height and the weight of the people should match as per their age to call a person healthy. For this, we should eat the diet containing carbohydrates, protein, fat, vitamins and minerals. We obtain these nutrients from daily diet we eat. If our diet contains these nutrients in greater or lesser amount for over a long time, we suffer from malnutrition.

The physical development in young children does not take place properly if the food they eat lacks nutrients. This can cause the diseases like: night blindness, marasmus and anaemia.

Night blindness

When one cannot see at dusk or at dawn, it is called night blindness. The people suffering from this disease cannot see in the afternoon as much as other normal people. The lack of vitamin 'A' can cause this. Night blindness can occur in the children if their mothers diet lacks vitamin 'A' during pregnancy. To be protected from this disease; we should regularly eat the food containing vitamin 'A' like: green vegetables, ripen fruits, carrots, pumpkin, stinging nettle, milk, ghee, fish, liver, etc.

Marasmus

If the body goes on becoming thinner and thinner, if it lacks required amount of carbohydrates and protein, the disease is called marasmus. This disease is common among the small children due

to the lack of balance diet or due to other infectious diseases. To protect the children from this, they should be given the food that contains enough amount of nutrition.

Anaemia

The lack of blood in body is called anaemia. This disease is common in small children and pregnant women. Anaemia is caused by the lack of iron in food or by being suffered from roundworm/tapeworm in stomach for over a long time. We can be protected from anaemia by eating the foods containing iron like: leafy vegetables (corriander, spinach, mustard etc.) dry vegetable (gundruk), fish and liver, etc.

Preventive measures of malnutrition

Women during pregnancy should be given nutritious food. Small children should be breastfed for at least two years. The fruits, vegetables, beans etc. produced in the kitchen garden are to be included in the diet.

Children should be given other food including their mother's milk. Similarly, the children should be vaccinated against several communicable diseases within 5 years from their birth.

We cook different kinds of food at our home. While cooking, we unknowingly lose the nutrients found in the food. Thus, if we can conserve the nutrients found in the food, we obtain the nutrients required for our body. For the same, we can adopt the following measures:

1. Do not waste the water used to wash the rice or gruel, put it in pulse or cooked vegetables
2. Avoid eating stale food
3. Do not cook green vegetables for a long time.
4. Do not put much spice and oil in food.
5. Cut the vegetables only after washing properly with clean water.
6. Cut the fruits only after washing them properly.

Teaching Instruction

Teach the lesson on focusing the effects of malnutrition on an individual's physical, mental and social aspects. Teach the lesson by informing the students the disadvantages caused by inability to preserve nutrients in the daily food. Take examples of behavioural application.

Activity

List the techniques of preserving the nutrients containing in food stuff and display it in the classroom.

EXERCISE

1. Match column 'A' with column 'B'.

Column 'A'		Column 'B'
(a) Night Blindness	( )	is caused due to the lack of carbohydrates.
(b) Anaemia	( )	is the source of iron.
(c) Marasmus	( )	is caused due to the lack of vitamin 'A'.
(d) Communicable disease	( )	is caused due to the lack of iron.
	( )	can trasfer from one person to another.

2. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. People become fat if suffered from malnutrition.

b. The lack of vitamin 'C' causes night blindness.

c. Washing the rice several times by rubbing destroys nutrients.

d. We should always eat nutritious food.

e. The vegetable should be cooked for a long time so that it becomes tender.

3 Answer the following questions.

a. What is malnutrition?

b. What types of food should we eat to be protected from night blindness?

c. Write any five ways to be prevented from malnutrition.

d. Write any five things to be paid attention to while cooking food.

Health Slogan

Let's eat nutritious food,
be safe and save from malnutrition.

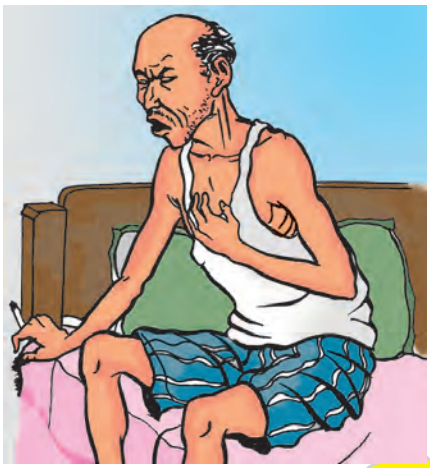
Lesson 7

Communicable Diseases

We can do many good things if we have healthy body. We can make our family happy and sound only when we are healthy.

Diseases are of two kinds: communicable and non-communicable. The diseases that can transfer from one person to another by germs through different means are called communicable diseases. Tuberculosis, cholera, measles, whooping cough, HIV and AIDS are some of the communicable diseases. These diseases can easily be transmitted from one person to another. People affected with the diseases like cancer, asthma, goitre, diabetes, etc. are also seen. These diseases are called non-communicable diseases. These diseases don't transmit from one person to another.

There are several causes of diseases. They include: polluted environment and climate; lack of personal cleanliness, unhygienic food, etc. Whenever a person is affected by a disease, the symptoms of the disease are seen on the person. Symptoms mean the signals seen after a person is affected by a disease. To be prevented from the diseases, daily physical exercise is necessary. Similarly, we should keep the environment around the house clean including personal cleanliness.



Some communicable diseases

1. Tuberculosis

Tuberculosis is a communicable disease which is caused by a kind

of micro bacteria. This disease can affect lungs, intestine, bone etc. of human body. The person with tuberculosis in lungs or chest has regular cough for two weeks or more. This disease can cause blood in phlegm. The disease is transmitted by breathing the air containing the bacteria that comes out in the air when the patients coughs or sneezes. Similarly, the use of clothes or other instruments used by the paient without cleaning by others can help in the transmission of the disease. The patient should cover their mouth while talking or while coughing. Taking medicines regularly can cure this disease. To be protected from this disease, the babies should be given BCG vaccine.

2. Chickenpox

This is the communicable disease in the children particularly below 10 years of age. Sometimes, even the adults can be affected by this disease. This disease is caused by a viral infection. The symptoms of the disease are: sudden fever, headache, no appetite etc. The rash of chickenpox develops in crops with raised red spots arriving first, progressing to blisters that burst, and forming open sores, before crusting over. Later red spots appear on the back and on the face. These spots spread in other parts of body. Those spots have water in it. These bubbles change into scar/ scale after four or five days.

The disease can be transmitted to other people if they use the articles, clothings and other items used by the patient without cleaning. To be protected from this disease, the patient should not be kept in contact with other children for a week. The articles, clothing and other item used by the patient should be reused only after cleaning them.

3. Whooping cough

This disease affects in the wind pipe. The disease can quickly

attack the children. This is a communicable disease caused by bacterial infection. The main causes of this disease are: malnutrition, lack of care, cold environment, pollution, etc. The initial symptom of this disease is common cold. Fever and continuous cough without phlegm are the symptoms of the disease. The things used by the patient like: clothes or utensils should not be used without cleaning. We should not eat the leftovers of the patient. Children are to be vaccinated with DPT on time.

4. Measles

This disease can attack the children of the age above six or nine months. The disease affects skin, eyes, windpipe, lungs and intestines. Its symptoms are: lack of appetite, runny nose, cough and high fever. Red spots appear on the face, on the back part of the ears. To protect the children from this disease, they should be immunized against the disease within 6 to 12 months. The things used by the patient should be used by others only after cleaning/washing them. The patient's mucus, phlegma, saliva , etc. are not to be thrown everywhere. They should be buried at a particular place.

5. Cholera

Cholera is a speedy communicable disease. This disease is caused

by a bacterium. Polluted water, lack of personal or environmental cleanliness, having rotten and stale food etc. can cause cholera. The patient suffers from frequent diarrhoea and vomiting. The patient has loose motion having stool like 'rice water'. This disease can affect anyone.

The stool and vomit of the patient should be buried to be protected from this disease. Stale and rotten food should not be eaten. Having nutritious and healthy food can protect us from this disease. Thus, healthy lifestyle; cleanliness; regular physical exercise and nutrituous food etc. helps us to be protected from all kinds of diseases.

EXERCISE

1. Match the diseases with their symptoms.

Diseases	Symptoms
(a) Measles	( ) blood appears in phlegm.
(b) Whooping cough	( ) red spots appear.
(c) Tuberculosis	( ) having stool like 'rice water'.
(d) Chickenpox	( ) bubbles with water appear.
(e) Cholera	( ) having continuous cough.
	( ) blood apperas in excrement.

2. Answer the following questions.

a. What is communicable disease?

b. Write the names of any five non-communicable diseases.

c. What are the symptoms of tuberculosis?

d. Write any five causes of being affected by disease.

e. Write the symptoms and preventive measures of whooping cough.

Lesson 8

HIV and AIDS

HIV (Human Immunideficiency Virus) is a kind of small/micro virus. Once this virus enters human body, it causes progressive failure of the immune system in humans. In such situation, a person is called HIV infected. The person is not called AIDS infected despite the fact that he has HIV virus inside his/her body. It may take quite a long time to be infected with AIDS once people have HIV infection.

The full form of AIDS is Acquired Immune Deficiency Syndrome. This is the situation when the symptoms of different diseases occur due to the poor immune sytem of body. Even a minor disease is difficult to be cured at this stage. This stage is called AIDS.

We may not know that we are infected by AIDS even after a long time of HIV infection. Blood test is necessary to confirm HIV infection. Those with HIV/AIDS infection should be treated equally as normal people. HIV/AIDS infected people need more care, love, affection and sympathy. We should not hate or discriminate them.

HIV transmits from one person to another in the following ways

1. Through unprotected sexual intercourse with HIV infected person
2. Through the reuse of syringes or other piercing instruments contaminated with HIV-infected blood
3. Through the common use of HIV infected needles and syringes

4. Through blood transfusion from HIV infected person
5. Babies born by HIV infected mothers

The following activities with HIV-AIDS infected people are safe

1. Hand shaking or playing together.
2. Using the same toilet or eating together.
3. Hugging, using the same comb, soap or clothes.
4. The stinging by mosquitoes previously stinging HIV infected.
5. When the infected person has cough or sneeze.
6. Taking care of infected people.

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. It is okay to use needles and syringes commonly.

b. Infected blood or body organs should not be transfused or transplanted in other people.

c. HIV and AIDS transfer through unsafe sexual intercourse with infected people.

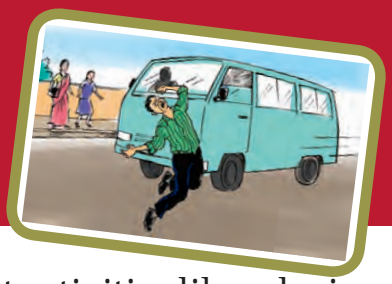
d. HIV and AIDS can transfer through hugging, eating from the same plate with infected people

2. Write answers to the following questions.

a. Write the full form of HIV and AIDS.
b. Write the symptoms of HIV and AIDS.
c. Write the ways of being protected from HIV and AIDS.
d. Write five ways where HIV and AIDS can not transfer.
e. How does HIV transfer from one person to another? Write the way.

Lesson 9

Let's be Safe from Accidents



Due to carelessness while doing differeent activities like: playing, going to school, working in the field or in factories, getting on the means of transport, climbing a tree or crossing the road; may lead to sudden accidents. Accidents may cause injury. Breaking of teeth or injury in eyes or in hands and legs may also occur. The accidents occur due to human error or carelessness. Accidents may also occur due to natural disasters like: earth quake, fire, storm, landslides, etc. These cause destruction of property and people.

The state of being safe from these accidents is caution or protection. We can avoid accidents if we do our work in safe way. The adoption of consciousness or caution for being safe from accidents is protection. Working with adopting safety measures decreases the probability of accidents.

We should follow the traffic lights and traffic rules while crossing the road. We should be careful while walking slopes in the hills

or while crossing the river. We should not play with medicine bottles. We should be cautious while doing the things like: walking on the slippery path, using the fire, swimming or using sharp instruments like knife.

Activity

Draw or collect the pictures of accidents and paste it in the classroom.

EXERCISE

1. Fill in the blanks choosing the correct words from the box given.

property and people, rules, conscious, destruction, accidents

a. Accidents cause destruction of .....

b. We should be..... while working to be safe from accidents.

c. Adopting the safety measures while working or playing protects from.....

d. We should follow the road..... while crossing the road.

2. Write answers to the following questions.

a. What is meant by accident and protection?

b. What measures are to be adopted to be safe from accidents?

c. What are the advantages of protection from accidents? Write any four.

d. List the accidents that can occur in classroom.

Health Slogan

'Be safe and save from accidents.

Lesson 10

Caution and First Aid

To be safe from accidents, we should be cautious while playing, walking and working at home and outside. The measures adopted to be safe from accidents are called cautious measures.

Sometimes accidents occur despite working cautiously. In such situation the person needs first aid. On-the-spot simple medical treatment that is given to somebody immediately after the accident before the person can be taken to a hospital is called first aid. It prevents the condition of the patient injured from worsening. First aid is to be done according to the injuries or wounds. It prevents the patients from untimely/sudden death.

The people wounded seriously in the accidents should take a rest. The wounds should be cleaned with mild hot water and soap. After that the bandage of clean cloth should be tied around them and the patients need to be taken to health posts or hospitals. In the countryside thorns, pieces of glass, etc. may pierce the human body. Rusty iron instruments may cause tetanus. While using the needle or other instruments for taking out the thorns or other pierced things from the body, they should be sterilized. For sterilization, those instruments are to be boiled in water. People bitten by poisonous snakes should not be allowed for movement. A piece of cloth or a handkerchief is to be used to tie tightly just above the bitten spot so that the poison can't spread. If bitten by a dog, the wound should be cleaned with soap and water. The vaccine against rabbies should be taken if the status of the dog is known: whether it is a normal or mad.

It will be easier for us to carry out first aid in case of accidents if we have kept the first aid box in our home. This box should

contain scissors, knife, blade, cotton, bandage, handkerchief, soap, paracetamol, oral rehydration solution, spirit, dettol, thermometer, etc. We should also suggest our friends keeping these things at home.

Teaching Instruction

Ask the students to demonstrate the first aid as it is carried out in the accidents. Teach the advantages and disadvantages of the techniques used in first aid. Discourage the unscientific techniques of first aid.

Activity

1. What accidents have occurred in your locality? Ask with your family members or community members. Write and present it to the class.
2. Consulting with your teacher, work together with your classmates and prepare a first aid box.

EXERCISE

1. How can the first aid be carried out in the following accidents? Write.

a. Serious wounds and injuries b. snakebite

2. Answer the following questions:

a. What is accident?

b. What is 'first aid'?

c. What are the advantages of first aid?

d. What instruments or things are to be there in the first aid box? Make a list.

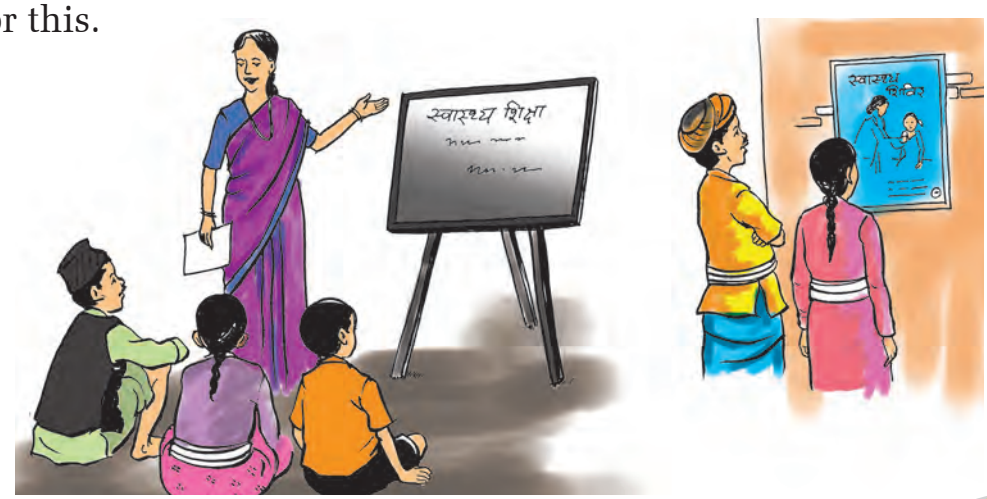
e. Where is first aid carried out and why?

Lesson 11

Health Service and Community Health

Community is the combination of several families. We all are the members of a community. We should pay attention to the things like: food habits, physical exercise and rest to remain healthy. Different health institutions deliver health services to make people healthy. The institutions which provide counseling and co-operate the people to remain healthy are called health institutions. We should take service and counseling from these institutions.

The common effort made by a community to make the health of community people better is community health. Community health creates awareness among people towards health by providing information on health services. Earlier, community health was confined to cleanliness but now its scope has become wider. Community health includes preventive, diagnostic, promotional and rehabilitation health programs. Community health cannot be made better with the effort of a single person. All the people of a community should be equally responsible for this.



Clean food and clean drinking water should be managed for a community. Individual and group cleanliness is to be paid attention to including the management of public toilets. Apart from these, all the people should work together for the management of wastes to keep the community environment clean. The programs on child health, family health, and different communicable and non-communicable diseases are to be run to increase awareness among the people. The programs are to be conducted to change in superstitious beliefs of people.

There are different institutions like: hospitals, health posts, sub-health posts, primary health care center, etc. to provide health service in community. In such institutions, doctors, nurses, health assistants, etc. do the jobs like taking care of patients, giving advice, etc. So, when we suffer from illness or before illness, we need to go to hospitals or health posts to get health service. We should visit health institutions from time to time to receive advice and suggestions regarding our health.

Teaching Instructions

Teach in the way that develops life skills, knowledge and attitude on the part of the students that they are encouraged to go to health institutions in case of illness. Focus your teaching accordingly.Give the students the detailed knowledge on the condition of and the services provided by first aid center, health post, sub-health post, hospital etc.

Activity

Prepare a poster that can create health awareness among the people of your community and paste it in your class.

EXERCISE

1. Choose the correct words from the brackets to complete the sentences given below.

a. ..... provide health services in the country side. (Teachers/Health workers/Engineers)

b. The institutions that provide health services are called..... (health posts/community buildings/area offices)

c. For the betterment of community health, assistance of..... is required. (individuals/ institutions/ community)

d. We should go to..... for health service. (hospital/ wizards/drug store)

2. Decide whether the following statements are 'True' or 'False'.

a. The service that is obtained before and after the illness for the betterment of health is called health service.

b. There is a leading role of health workers for the betterment of community health.

c. We should visit wizards for the health tips.

d. Hospital is the only institution that provides community health service.

3. Answer the following questions.

a. What is health service?

b. What kinds of health programs are included in community health?

c. Who has the leading role for the betterment of community health service?

d. Who provides health services in community?

Health Slogan

'Let's go to the nearest health institution if health problems occur, fetch others there too.

Lesson 12

Let's Enjoy the Health Service and Co-operate

The teacher and the grade five students are talking on health.

Teacher: Hari, why didn't you come to school for the last two days?

Hari : I was suffering from fever. So, I was unable to come to school, Madam

Teacher : How are you feeling today?

Hari : Today, I'm okay, madam.

Teacher : Where did you go and what did you do there while you were suffering from fever?

Hari: I went to the healthpost of my village, got checked, had some medicine and recovered, madam.

Teacher : Well done! You did well. Others should also be taught this. Today, we will learn the same thing and will have discussion on it.

Students : Okay, madam.

Teacher : The service that is obtained after or before the illness is called health service.

Student : Where can these services be obtained from, madam?

Teacher : From the health posts, sub-health posts, or from hospitals located in our community. Sometimes, these services are available at mobile health camps too.

Student : Who provides these services, madam?

Teacher : These services are generally provided by health workers and health assistants. If they find the illness critical, they advise the patients to visit hospitals to get checked with doctors.

Student : Madam, we and other people in our community should go to health posts if we become ill, shouldn't we?

Teacher : Exactly! Whenever we become ill, we need to visit such institutions for treatment. We should help the family members or other people of the community to visit the health institutions. We should fetch all the people suffering from illness to the health institutions instead of visiting wizards.

Student : Madam, we had little knowledge on these things. We will convey the message that we should visit health institutions to obtain health services for our family and community members.

Teaching Instruction

Teach with the focus that the students will have positive attitude that we should get treatment from health institutions.

Activity

Divide different roles among your friends: doctor, patient, nurse, health assistant, etc. Now play the roles of those characters with their tasks of providing health service.

EXERCISE

1. Decide whether the following statements are 'True' or 'False'.

a. We should go to hospital when we become ill.

b. We should have our body checked from time to time.

c. We should help to reach any of the community members to health institutions in their illness.

d. We should not allow health posts to be established in our village or community.

2. Answer the following questions.

a. Where should we go when we become ill?

b. Write any five services available at hospitals.

c. Why is it necessary to publicize about the health services?

d. What is mobile health camp?

Lesson 13

Smoking

Smoking means particularly the consumption of tobacco materials. Some examples of smoking are: inhaling the smoke by hookah and by wrapping the tobacco in a leaf or in a paper. The consumption of tobacco materials like: cigarette, cigar, tobacco or tobbaco powder is called smoking. The statistics has shown that about 1300 millions of people smoke. People around the world consume the tobacco in two ways:

a. Inhaling the tobacco smoke, for example: cigarette, cigar, tobacco, tobacco powder, etc.

b. Chewing the tobacco putting between the gum and lips, for example: dry tobacco, tobacco leaf powder, etc.

Different researches have shown that smoking contains nearly 4000 kinds of harmful and poisonous chemicals. These also include the elements like: nicotine, tobbaco tar (sticky matter) and carbonmonooxide. These elements get into the body in smoking which can cause heart diseases, cancer, asthma, dental diseases, etc. Pregnant smokers not only harm themselves but also to the babies inside them.

Smoking, together with the smokers, harms the people living together, too. Young children are highly affected by it. So, everyone should try their best to avoid it. We should not develop the habit of smoking by immitation or by following up the rumour. In the beginning, people start smoking by not knowing its harmful effects or by immitating others. If the family members or other people in the society are found to be smokers, they should be advised not to do so.

We should improve our daily behaviour to avoid smoking. Apart from this, the following techniques are to be adopted to protect and to be protected from this bad habit:

a. Making commitment for not smoking
b. Keeping distance from smokers
c. Advising family members to quit smoking if they smoke
d. Declaring school area as 'no-smoking zone'
e. Participating and encouraging others to participate to publicize against smoking

Activity

1. Prepare slogans against smoking in different groups and organize a rally against smoking.
2. Organize a lecture program on 'Smoking claims life'.

EXERCISE

1. Fill in the blanks with correct words.

a. Smoking means the consumption of .....materials.

b. If pregnant women smoke, it also affects the..... in the womb.

c. Tobacco contains nearly 4000 kinds of harmful and poisonous.....

d. The harmful elements in the tobacco cause diseases like: asthma,....., heart disease, dental diseases etc.

e. I advise my family members .....

2. Match the words in column 'A' with their descriptions in column 'B'.

Column 'A'		Column 'B'
(a) Dry tobacco	( )	the disease caused by smoking that can appear after a long time.
(b) Cigeratte	( )	the problem that appears shortly after smoking.
(c) Cancer	( )	the object used to inhale smoke.
(d) Cough	( )	eyes become smaller.
(e) Nicotine	( )	dry tobacco consumed by chewing
	( )	harmful element found in tobacco.

3. Answer the following questions in short.

a. What is smoking?

b. Write any four immediate effects of smoking.

c. Write any five techniques of avoiding smoking.

d. How do people adopt the bad habit of smoking? Write any three examples.

e. Write the names of any five harmful elements found in tobacco.

Health Slogan

Clean environment and smokingless life for healthiness.

Lesson 14

Alcohol and Drugs

Alcohol and drugs are two different types of intoxicating substances. These substances weaken our body. There exists tradition of drinking and consumption of drugs in different communities as per their culture and religious traditions. The consumption of these substances decreases not only the physical ability of people but also decreases their social prestige. Furthermore, it causes economic loss.

a. Alcoholism

The consumption of alcoholic drinks like: wine, beer, alcohol, whisky, rum, etc. is called alcoholism.

In the beginning, people learn to drink by following up the rumours or by seeing the family members drink or during the festivals. Later on, it changes into habit. The consumption of these substances makes people physically weak. They particularly affect liver, heart and brain of humans. During intoxication, the brain does not work properly and people are likely to do anything whether good or bad.

b. Drugs

The chemicals, which affect the nervous system of human brain and affect the body system are called drugs. The drugs like hemp and narcotic can be directly obtained from plants and can be consumed. The drugs like hemp and heroin are made from other different drugs. The consumption of these substances

brings change in normal behaviour of an individual. Pondering, staring, having useless ideas, obstinacy/persistence are some of the symptoms of drug addicts. The continuous consumption of these substances causes the problems like: imbalance in brain, sleeplessness, and sight/hearing/contact illusions. If the consumption goes on, people become mad and they finally die.

c. Programs against alcoholism addiction and drugs

We should never use alcohol to keep ourselves physically, socially and mentally healthy. The family members and the society should be made aware of their effects. For this, awareness raising programs should be organized. Different organizations have been established in our country to raise awareness among the people against these bad habits. Different governmental organizations and non-governmental organizations are in operation against these bad habits. The preventive efforts against these habits have been made for the last 25/30 years; however, it has not come under full control. We all should avoid and ask others to avoid these to control bad habits. Different places in our country have been declared as 'No alcoholic zone'. This should be well-adopted in behaviour.

Activity

1. Discuss in groups the aspects of drinking given in the following table. Fill in the table and present it to the class:

s.no	Name of drinks	How people learn	Physical effects	Mental effects	Social effects
1.					
2.					
3.					
4.					

2. Prepare and demonstrate a drama against drinking and drugs with the help of the teacher. Invite your guardians to the program too.

EXERCISE

1. Put a tick (√) if the statement is correct and a cross (×) if it is wrong.

a. Drinks and drugs are intoxicating substances.

b. It is good to drink and consume drugs as per family tradition.

c. Narcoics fall in liquor group.

d. Drinking causes bad effects in physical, mental and social aspects.

e. It is the duty of all to run programs against the consumption of drinks and drugs.

2. Answer the following questions.

a. Write any five substances that come under drinks.

b. What suggestions do you give to your family members to give up smoking?

c. Write any two effects of drinking.

d. Write any three symptoms of drug addicts.

e. What can you do to be protected from drunkards and drug addicts? Write in two points.

Health Slogan

Let's stop the consumtion of drugs from today and lead a peaceful and healthy life.

Lesson 1 Physical Education

Locomotor skills

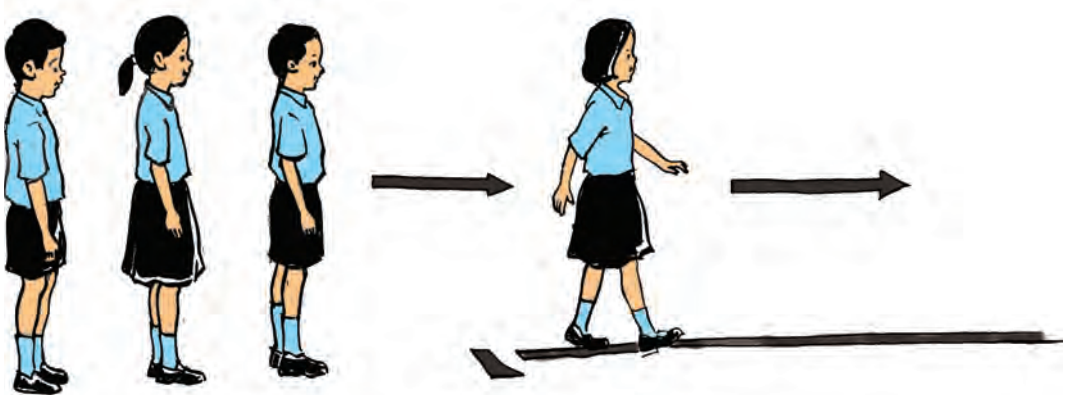
Walking, running, jumping, throwing, etc. are our daily activities. Doing these activities regularly helps us to be healthy, strong, fit and free from illness. These different types of physical activities are locomotor skills. These skills are the basic skills of physical education.

Walking

No harm will occur in our body if we walk properly. Walking with legs apart, walking on toes, and walking with joining the legs, etc. cause difficulty in walking. While walking, we should start walking on heels and slowly change walking on the toes thereafter. We should walk with our body straight. We should also move the hands naturally as per the movement of legs. Let's do the following activities for proper walking.

Activity 1

Let's walk with long strides in a straight line.

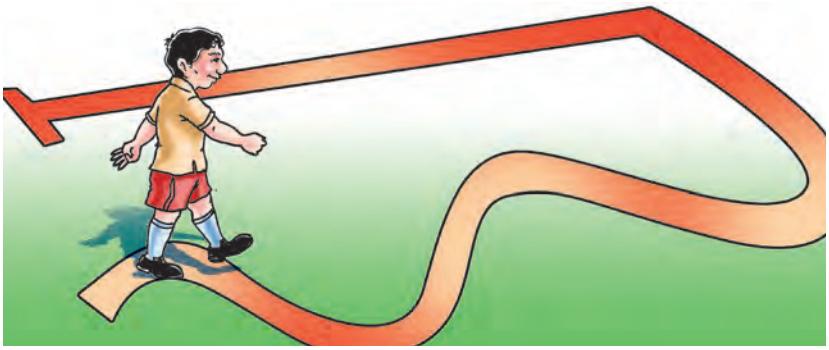


Activity 2

Let's walk quickly over the line of a round circle and complete one circle.

follow me

Activity 3



Let's walk quickly over the zigzag line. On the return, let's walk over the straight line in the same way.

Look, learn and do

Practice 1. Make a line with two in each and walk with the identical movement of hands and legs.

Practice 2. Make a row with three in each and walk with the identical movement of hands and legs.

Practice 3. Look, who will be the first among those starting their walk from the line.

Practice 4. Complete the distance of 30m with different styles of walking.

Running

We can reach our destination more quickly by running than walking. While running, hands and legs move quickly. Rapid respiration occurs. Running keeps us healthy. There are different types of running. We should do warm up activity before running. We should start running only after warm up.

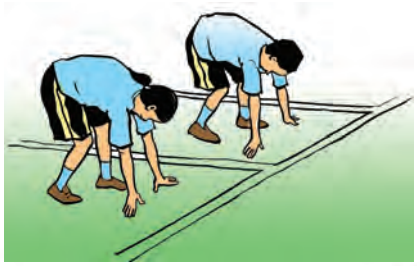
The participants of the competition should go to the track only after the announcement of their names. Track is the runway for runners. Only one person runs in one track. We should learn all the rules of race beforehand. Short-race, hurdle race, relay race are the different types of race. Among them, we will practice the techniques of 75 m short race.

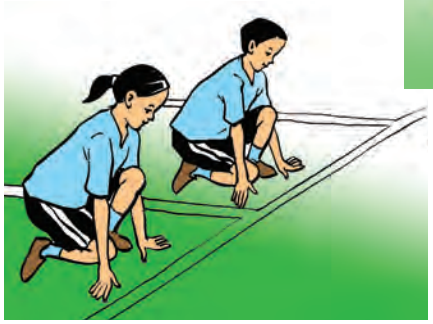
75m. race

Starting and commanding technique of running

Activity 1

Keep your friends in line with 5 students in each. Ask each group to run with the command 'On your mark, get set, go' one by one. Give the command loudly to make your friends run.





Activity 2

Hurdle Race

Let's practice the race with different types of hurdles on the way as given in the picture.

Do, Look and Learn

Practice 1. Practise climbing up and down the steps of a ladder nearby.

Practice 2. See, who will be the first in 75m race.

Practice 3. Give command to your friend to start the race and run in your turn too.

Teaching Instructions:

Collect all the necessary things like: ball, lime, tape, etc. before the activity time. nvolve the students in activities only after warm up. Get each activity done in a sequence. Motivate the students to do the activity only after demonstration by teacher. Think of the ways to be safe from the possible accidents which are caused by hurdles in hurdle race. Make the students aware of the accidents likely to occur during climbing up and down the steps Keep in mind the time and joyfulness of the activity. Involve the students in the practice activities according to the weightage.

Lesson 2

Jumping

Pushing oneself suddenly off the ground and is called jumping. We can move forward, backward, right, left, i.e. to any direction by jumping. We need jumping skill to cross a river or a road too. There are different types of jumping.

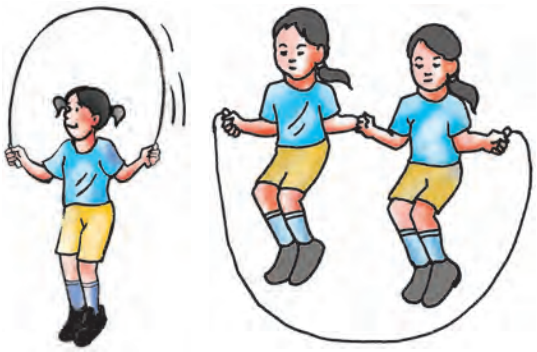
Long jump is a joyful game. Long jump can be done by running or by standing. Take off board should be trodden while jumping. Take off board is put at the end point of racecourse. After take off, we should fly in air and keep the feet on land properly.

High jump is also a joyful game. High jump crossbar is kept for jumping. The bar easily drops if touched by any of the body parts. The specific area designed to land after jumping is called landing area. The area should be smooth. Now, let's do the activities to practise long jump and high jump.

Activity 1

Skipping

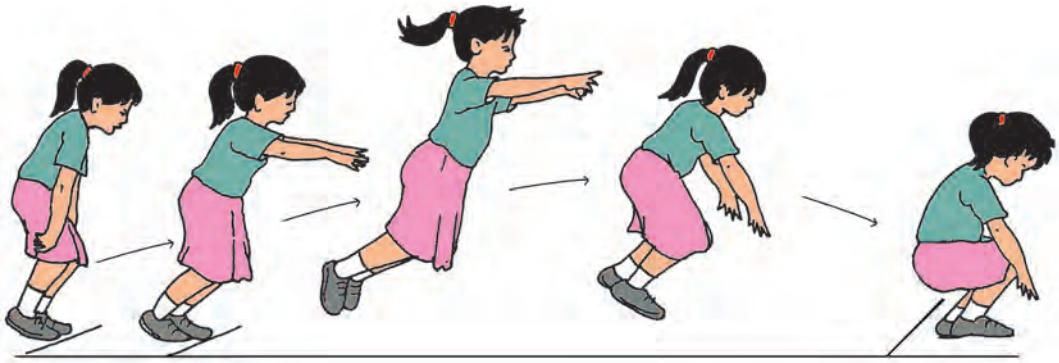
Let's keep both the legs together. Grip the rope at the grip spaces of the rope with your hands, move it round from forward to backward and skip the rope by jumping off the land. Let's pracitse skipping more and more. Jump off the ground at the same time with both of your legs in the air.



Activity 2

Long jump by treading on the take off board

We will stand in a queue. We'll run along the racecourse after the announcement of our name and we'll practise long jump with treading the take off board.

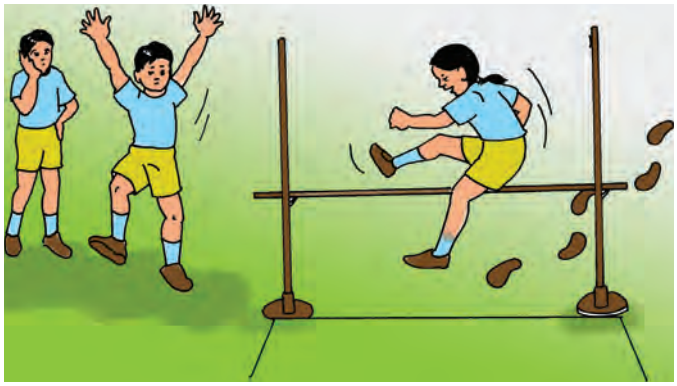


Activity 3

Different styles of high jump

Let's stand in a queue and practise different styles of high jump. Teach the things we learn to friends too. Do the activity according to the skill.

वेस्टर्न रोल तरिका



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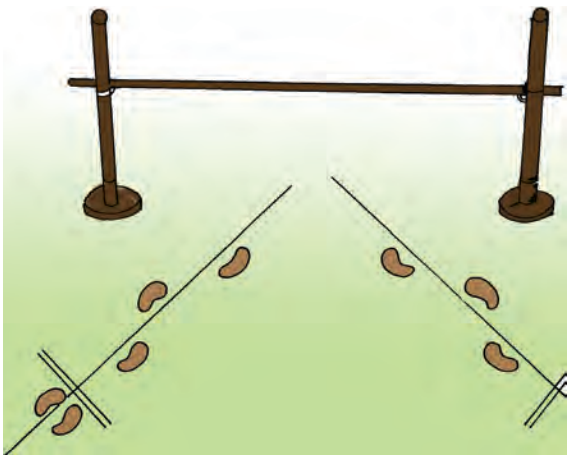
Activity 4

High jump on increased height

We can practise high jump at different heights. Increase the height by 1cm at every successful attempt of jumping.



Look, do and learn

1. Do jogging one round around the ground. Bend down wardat every 10 meters. Go on jumping over everyone.
2. Use the high surface or a tall bench to make the height of 30 cm near the landing area. Jump off the height and practice flexible landing.
3. Do long jump standing at the same place (not by running). Measure the distance you can jump.

Teaching Instructions

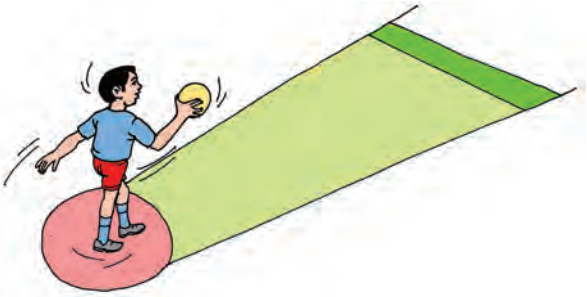
Get any of the activity done only after warming up.
Gather the materials for skipping in time.
Make the incompetent students adopt 'Look & Learn' technique.
Observe the landing area and make the students aware of possible accidents
Never forget to praise correct activities.

Lesson 3

Throwing

Sending something away through the force, especially by the movement of the arms, is called throwing. Throwing is the skill frequently used in our daily life. In throwing, especially, arms are used. This skill is developed by throwing light or heavy object. Throwing a tennis ball or an iron ball or a stone, etc. are the examples of throwing. Basketball, handball, javelin, cricket, disk etc. are the throwing games in sports.

We should do different activities for the development of throwing skill. Throwing is good if the movement of arms, legs and body is maintained properly. We will practise throwing small, light and heavy balls in this lesson.



Activity 1

Hitting by a ball or chungi

Let's make a group of 10-15 and with a boundary line, let's play hitting by chungi.

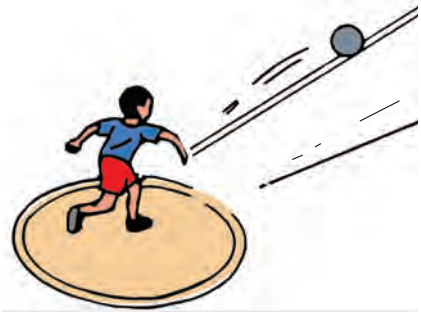
Activity 2

Bouncing the ball with two hands and throwing it into the basket. Let's stand in a queue making groups according to the number of students. Run and throw the ball in the basket and go back to the end of the line.

Activity 3

Throwing a heavy ball from a circle

We follow the rules of shot put while throwing a ball from a circle. Let's throw the heavy ball as far as possible. Ask your friend to measure the distance with a tape.



Do, look and learn

1. Make a group of two and pass a big ball to each other turn by turn. Do sit up at the time.
2. Throw the ball from a particular spot as far as possible and measure the distance. See who can throw farthest.
3. Do skipping for 10 meters. Do long jump after running for about 10 meters. At last throw the tennis ball from there and return.

Teaching Instructions:

Ask the students to do the activity after demonstration by yourself or by better students. Use volleyball, football, basketball as big balls; cricket ball as a heavy ball and tennis ball as a light ball. Apart from these, local materials can also be used in this activity. Make the place vacant where the heavy ball is to be thrown.

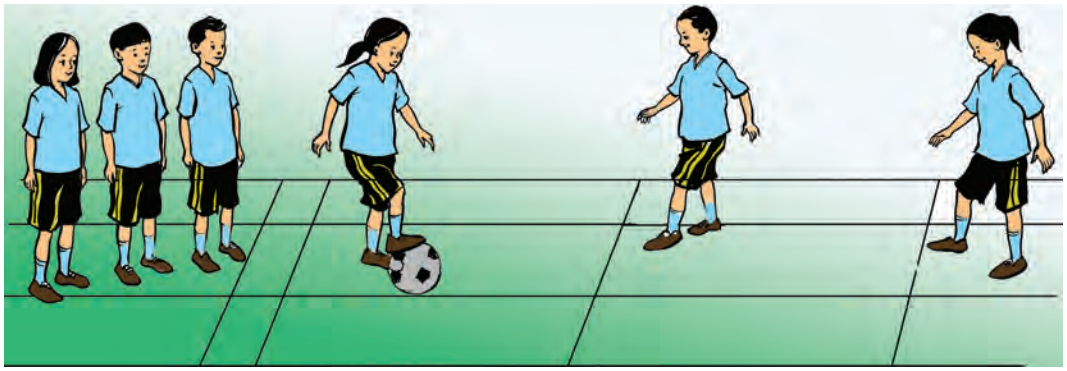
Lesson 4

Relay games

The games that are played in team with members co-operating each other are called relay games. It is enjoying with playing relay game where one member of the team helps another member. Relay games can be played with or without something in hands. We go to open ground to play relay games.

Activity 1

Ball pass and target relay



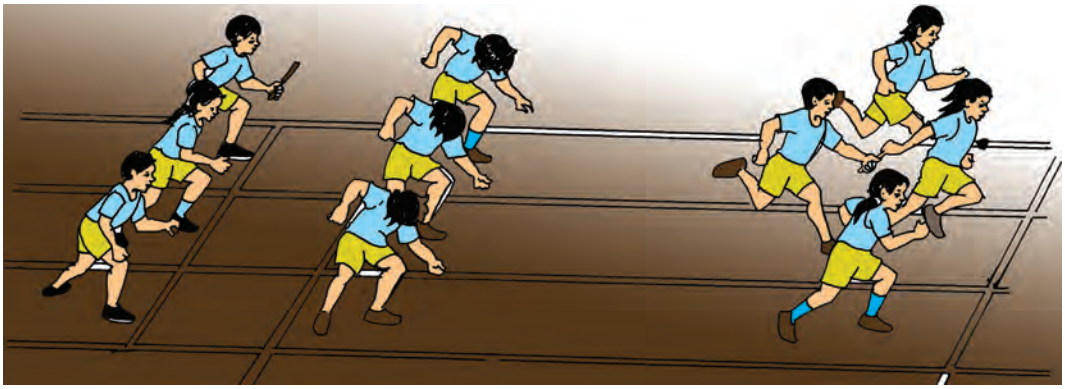
Activity 2

Baton pass relay

Activity 3

Broad jump, hop and chungi pass relay

Relays can be played in different ways. Three tasks are to be done in hop and chungi pass relay. Let's stand in four lines behind the starting line. As soon as the starting signal of the game, the first in the row should cover the distance of 5 meters hopping on both legs. Another 10 meter should be covered with single leg hop. Reaching on the finishing line, face a member of your team and pass the chungi to him/her. Other friends of the groups repeat the same activities until no one in the team is left. Let's see which team will be the first. Let's congratulate the winner team.



Look, Do and Learn

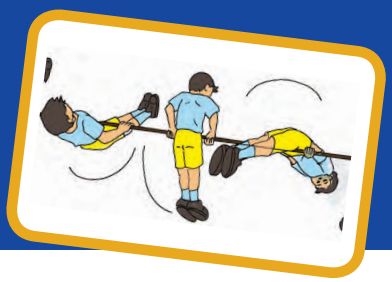
1. Make four teams and play baton pass relay race.
2. Play the chungi game in a round circle, congratulate the winner by clapping.
3. Do target practice of throwing a ball in a basket kept 10 meters away.

Teaching Instructions

Get any of the activities done only after warming up.
Make the rule that no underhand is allowed in target practice.
Observe the play ground and make the students aware of possible accidents.
Use smooth materials in landing area.

Lesson 5

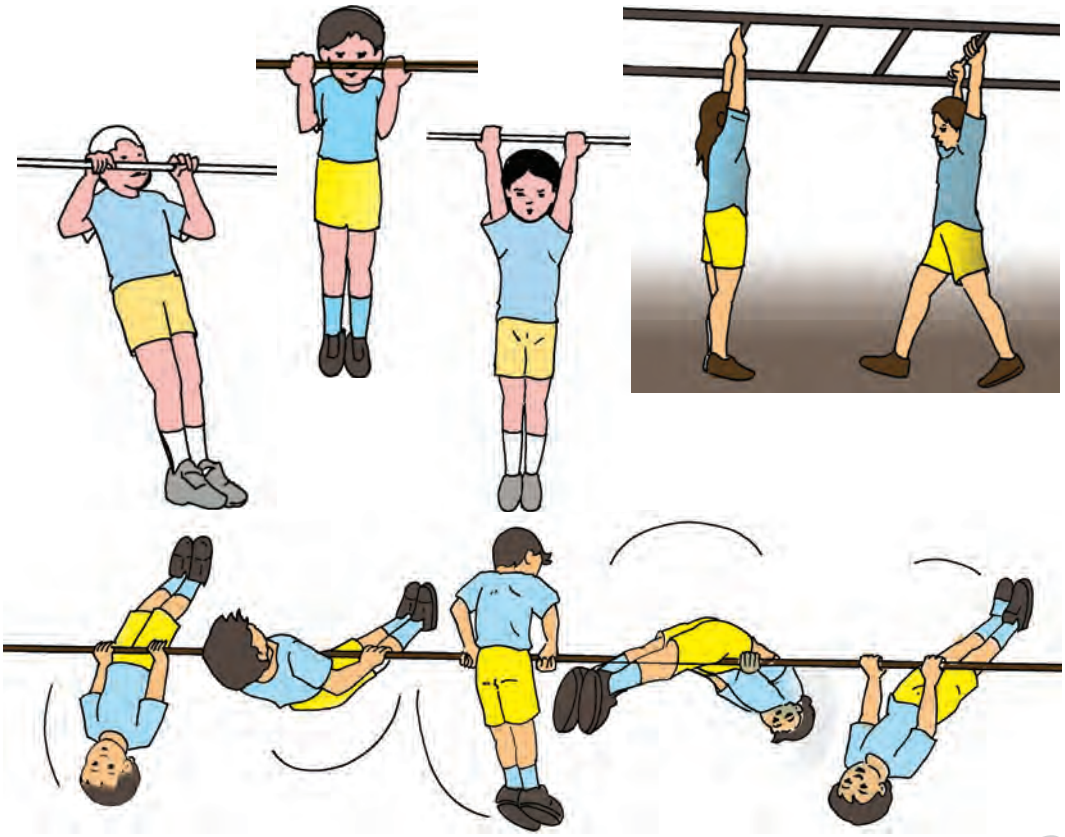
Non locomotor Skills



The physical activities done without changing the location are the non-locomotor skills. These activities can be done while standing, sitting and lying too. Pulling, pushing, throwing, swinging, stretching, etc. are the activities done at non locomotor state. These activities help in doing our daily works. We'll practise the following activities to develop non-locomotor skills.

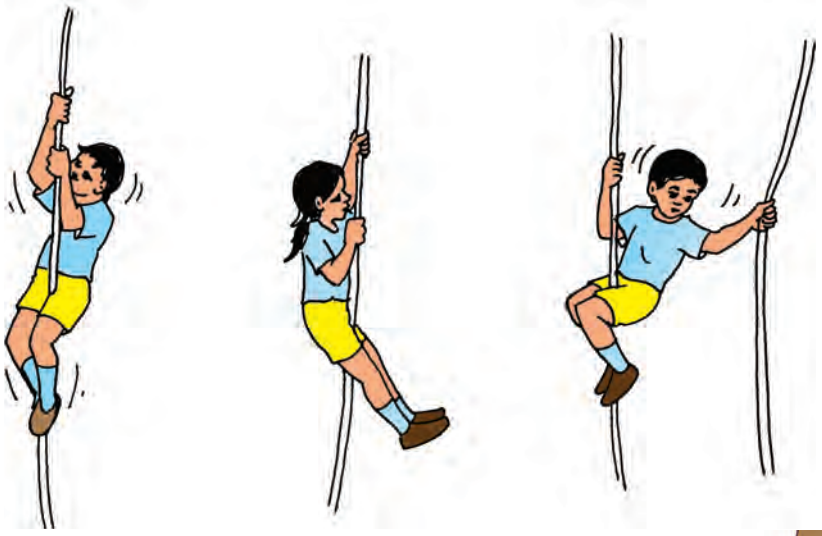
Activity 1

Hanging on a bar



Activity 2

Climbing along a rope



Activity 3

Climbing up and down a pole

Look, learn and do

1. Climb up a pole and swing along the bar from one end to another end.
2. Try to move from one place to another hanging along a thick rope.
3. Try swinging by hanging on the rope with hands.

Teaching Instructions

Instruct the students to climb up and down only on somebody's inspection. Encourage the students in doing activities. Observe the play ground and make the students aware of the possible accidents.Involve the students in the abovementioned activities only after enough practice of arms and legs.

Lesson 6

Drill

Drill involves different types of physical exercises done in a group done on the command of a team leader. Different activities can be done in drill. If demonstrated at a function, a drill makes a program attractive.

In drill, everyone should stand in row and in line. Stand at ease, attention and rest are the activities regularly done in drill. All the activities in drill start from 'attention' state. We will practise mark time, quick march and halt in this lesson.

Activity 1

Mark Time

Immediately after the command of 'mark time' at attention state, start mark time supposing 1 for left leg and 2 for right leg.

Teaching Instructions

Focus on other activities for warming up.Give clear idea of low and line. Make the sound clear and loud in giving command.Motivate the students to be disciplined.

Activity 2

Quick march

Immediately after the command of quick march, move ahead counting 1-2 (1 for left leg, 2 for right leg). Move your right hand at 1 and left hand at 2.

Rule of command

1. The team will quick march. (information)
2. Mark…. Quickly. (Command)
3. Marking quickly immediately after the command. (activity)

Activity 3

Halt

When the team has their left legs on the land, the command 'halt' is to be given. We will practise 'halt' as per the rules given below.

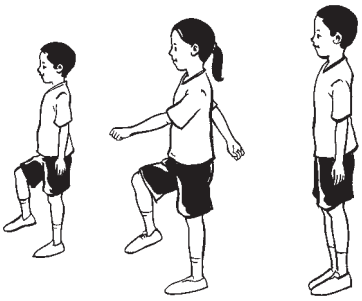
Right leg – check

Left leg – one

Right leg – two (halt)

Rule of command

The team will halt. Halt…!



Look, learn and do

1. Give the command 'halt!' to your friends and make them practise.
2. Make rows with three people in each and ask them to do quick march and give command to halt.
3. Make groups, ask them to do mark time followed by the command to halt.

EXERCISE

1. What organs of body come in motion in drill?
2. Which leg is used in what activity in the command 'halt'?

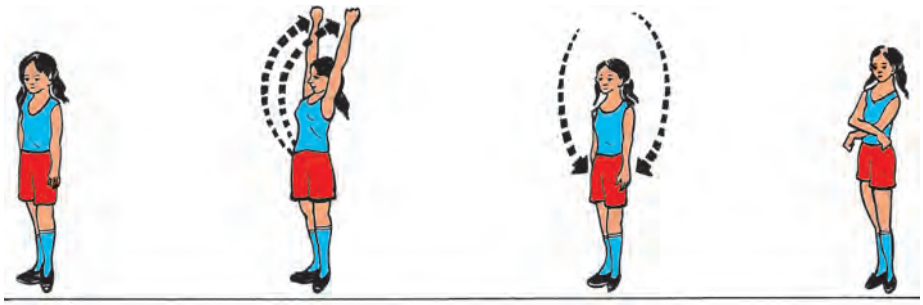
Lesson 7

Physical Training (P.T.)

Physical training makes our body healthy and smart. It helps us to be disciplined too. Thus, we do physical training regularly in group. We can prepare for the demonstration of rhythmic and joyful physical training at school functions. We practised the physical training activity 1 to 13 in grade 4. Now, we practise these in rhythmical tune of music or of a song one by one.

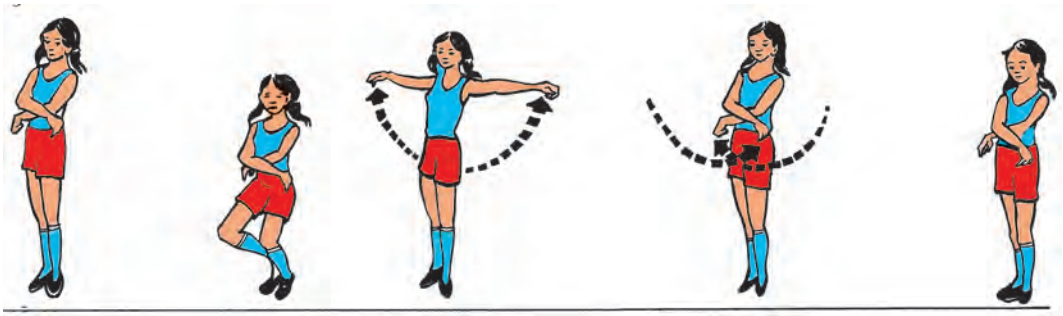
Activity 1

Body stretching training



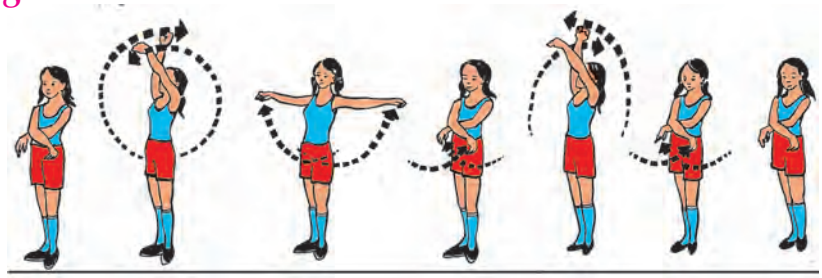
Activity 2

Exercise of arms and legs



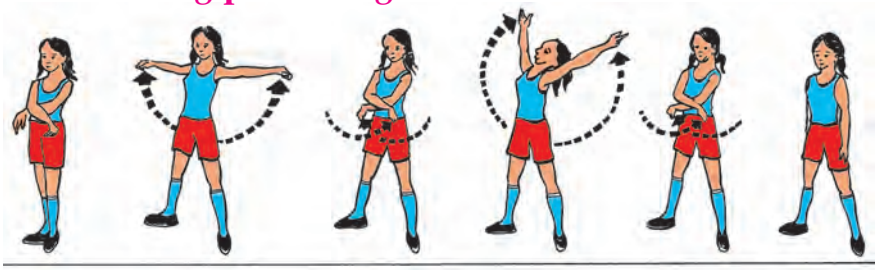
Activity 3

Training of shoulder



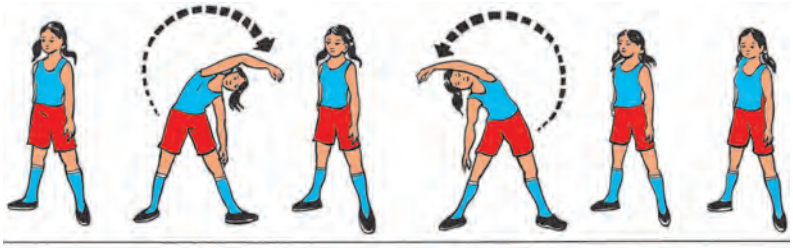
Activity 4

Chest stretching p training



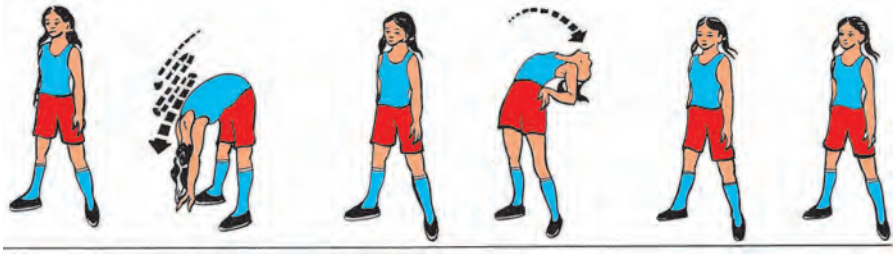
Activity 5

P. Training of arms and waist



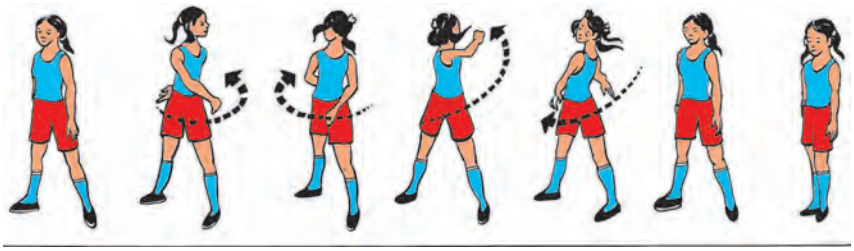
Activity 6

P. Training of back and waist



Activity 7

Training starting from heel



Activity 8

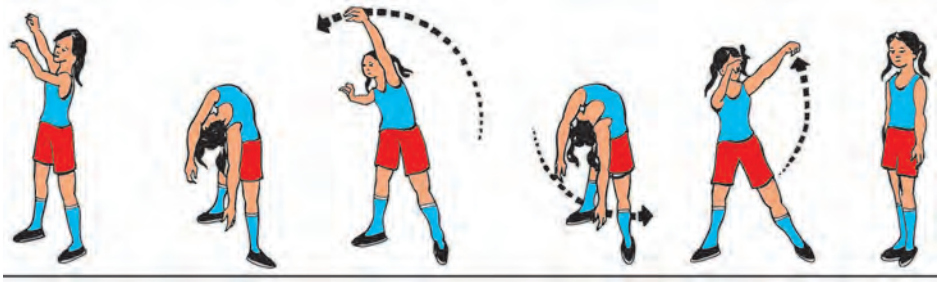
Stretching training

Activity 9

Training by bending down

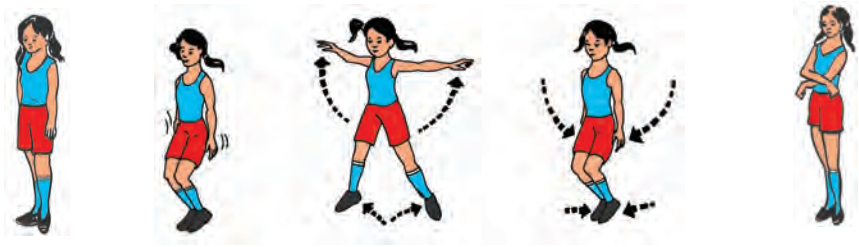
Activity 10

Body revolving training



Activity 11

Body bending training



Activity 12

Training of respiration and body

Activity 13

Training of respiration and calming down/Cool down the body

Look, learn and do

1. Practise physical training alone or with friends.
2. Practise physical training in group according to the rhythmic tune of music.

Teaching Instructions

Observe whether the training is being done correctly or not.Pay attention whether the physical training is done as per the rhythm or not.

Lesson 8

Minor and Local games

Minor games

We play different games with friends by runnung, chasing, touching and catching. These basic activities help in playing main games. Free city, boatman, be in number etc. are some minor games. The games which help in playing main games are called minor games. For minor games, even few rules and materials are enough. The number of players and the measurement of the playground are not definite. These games can be played anywhere at anytime So these are called minor games.

We will play some minor games looking at the pictures given below.

Free City

Activity

Kathmandu

Biratnagar

Pokhara

Nepalganj

Teaching Instruction

Involve the students in warming up before playing the game. Adopt the safety measures. Determine the numbers of city on the basis of the playground and number of students. Try to make the game joyful by clearly pronouncing the names of cities frequently. While the students are going to the free city as uttered by the teacher, whoever is touched first by the leader is to be nominated a new leader. Determine the time for the game as per the necessity.

Activity 2

Boatman

Let's practise the boatman game by looking at the picture

Teaching Instruction:

Use bags, shoes and lime for making border.Observe whether students are acting exactly like a boatman crossing the river or not. While crossing the river, whoever is touched by the boatman will be his friends next time. Ask one person among many boatmen to act as a boatman. Determine the time according to the interest of the students.

Activity 3

Be in number

As shown in the picture, run in a circle. At the time, the teacher will say a definite number; you should together try to be the same in number (by holding each other's hand)

Teaching Instruction:

Involve the students in warming up before playing the game. Adopt the safety measures. Determine the numbers of city on the basis of the playground and number of students. Try to make the game joyful by clearly pronouncing the names of cities frequently. While the students are going to the free city as uttered by the teacher, whoever is touched first by the leader is to be nominated a new leader.Determine the time for the game as per the necessity.

Lesson 9

Local Games

The games which are played at local level in their own way are called local games. These games have been played in our locality from the very beginning. The rules of these games are not uniform. Local games are compatible with the geographical structure, religion, culture, castes, costume and weather. They are called local even because they are played locally in local ways. Ghwainkasa, making a pile fall down, Gatta, Dandibiyo, and Telkasa etc. are some local games.

Activity 1

Making a pile fall down

Now, we play the game between two teams as shown in the picture.

Teaching Instructions

Divide the students in two equal teams and determine the distance from where the pile is to be fallen down. If one team fails to make the pile fall down, it's another team's turn. Determine the boundary as per the necessity. If the ball thrown by the team making the pile fall down hits the pile making team, keep the participant out of the boundary. The team which is able to form the pile according to the rule deserves the score. Also congratulate the team.. Look at the stopwatch to calculate the time taken by each team to form the pile or to keep all the members of the opponent team out.

Activity 2

Dandibiyo

The game which is played by striking a small pivot (biyo) of 10 cm with a stick (dandi) of 45cm is called Dandibiyo. Let's look at the picture and practise Dandibiyo.

Teaching Instructions

Determine the boundary. Keep in mind the possible accidents caused by being hit by the pivot (biyo). Divide the students into two teams. Record the scores obtained by each team striking the pivot (biyo). You can use the stick (Dandi) or the pivot (biyo) that is twice, three times or four times longer.

Encourge the students to play new local games.

Lesson 10

Creative Games

A. Story games

The games played being based on stories are called story games. Since these games are based on stories, they are interesting and joyful.We can practise/play the following story games:

Activity

1. The acting game based on the story 'The Fox and The Grapes'
2. The acting game based on the story 'The Lion and The Hare'

B. Imitating (Acting) games

We enjoy playing with the acting of animals and birds. Likewise role play of different people of society is also joyful. These types of activities entertain us. Similarly, these help in physical, mental and creative ability of an individual.

Duck walk

Let's walk like a duck in squatting down with both the hands behind.

Produce the sound 'quack…. quack' and move your hands like a duck moving its tails from time to time.

Duck walk in pair

Cover the distance by walking like a duck with the same pace in pair.

Crab walk

Be in position with your knee bent down, hands behind and the body raised. Now, move ahead like a crab with the help of hands and legs.

Frog hop

Be squatted with both of your hands on the waist and move ahead by hopping on both feet as much as you can.

Elephant walk

Hold your nose with your thumb and first finger of left hand and, through the hole made, push your right hand out so that it looks like an elephant trunk. Now walk with long and swift strides.

Teaching Instructions

Involve the students in general exercise for warming up. Colletct the materials and create environment for acting. Give chance to every student to act. Create stories as per the situation and ask the students to act accordingly. Demonstrate each activity by yourself in front of the students. Discuss the pictures and motivate the students to imitate. Ask students to act individually, in pair or in groups separately. Ask every student to act if possible. Increase or decreae the walking distance on the basis of the students' ability.

Lesson 11

Ball Games

Ball games are very interesting for us. Despite being interesting, ball games involve many of your friends at the same time. Balls can be played with both hands and legs. Passing, dribbling, servicing etc. are the basic skills of ball games.

Dribbling a ball

Dribbling is moving forward by hitting the ball with own legs sometimes to the right and sometimes to the left. Let's practise dribbling as shown in the picture.

Dribbling in a circle

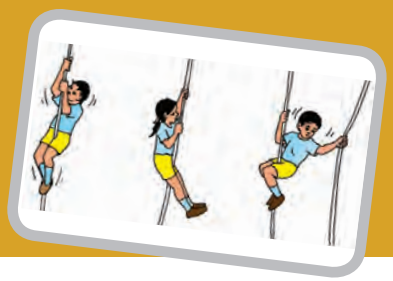
Moving forward by bouncing the ball on the ground with hand is called bouncing. Make English number '8' by bouncing as given in the picture.

Teaching Instructions

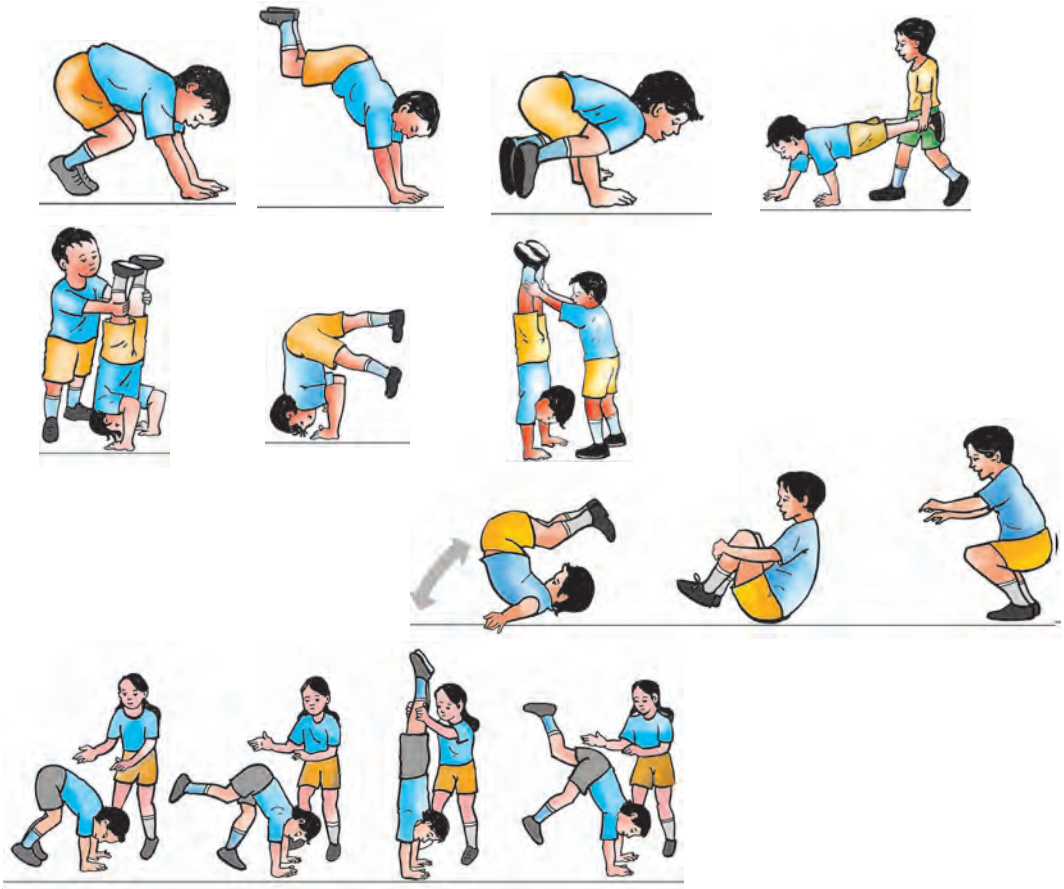
Divide the students in groups according to the number of balls available. Encourage the students to pracitse dribbling and bouncing in interesting structurers besides given above (8). Ask the students to dribble the ball with the part between the toe and heel while dribbling with leg.

Lesson 12

Balance Work



We should be able to keep our body by ourselves in balance. It may be easy to keep the body in balance by standing on foot or by sitting. Besides these, we can keep our body in balance with different ways. Being able to raise our body as we wish is balance work. Standing on hands, standing on head, standing on one leg, etc are the different ways of keeping our body in balance which we learned in earlier grade. Here, we will practise to keep our body in balance with our body in different shapes and sizes.



Activity

1. Balance maintained by standing with stretched hands on the back of two people who have bent down.

2. Balance maintained by raising the legs straight of two people standing on shoulder

3. Balance maintained by two people with one's one leg rose

Practise, look and learn

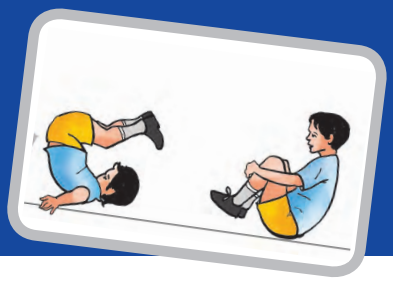
1. Do balance work alone.
2. Do balance work in pair.
3. Do balance work in group.

Teaching Instructions

Praise to encourage the students. Observe the play ground and make the students aware of possible accidents. Involve the students in any of the activity only after warming up. Instruct the students carefully.

Lesson 13

Tumbling work



Gymnastics is an important game. The ability of the players to keep body in balance on their own by means of different activities with or without using equipment is called gymnastics.

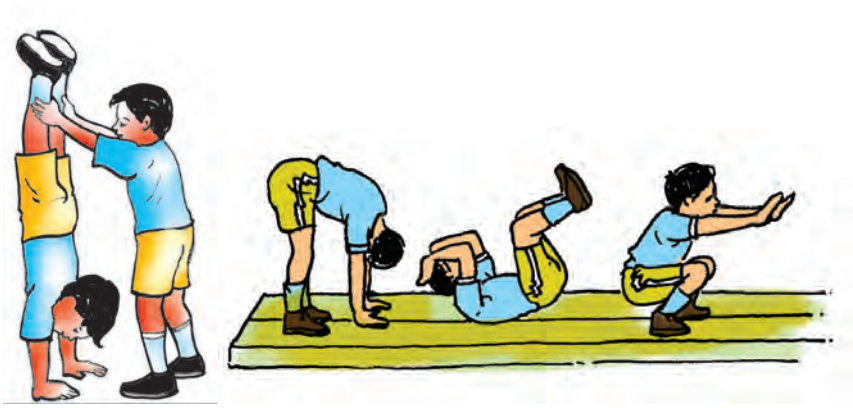
Tumbling the body forward and backward are tumbling works. These activities help us to be protected from serious injuries. In this class, we will learn different tumbling works standing on shoulder.

Activity 1

Front roll

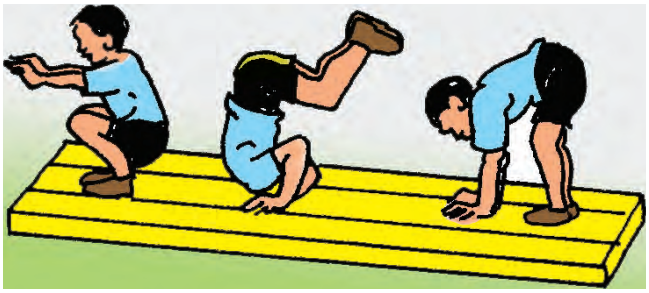
Activity 2

Back roll



Activity 3

Side roll



Look, learn and do

1. Do tumbling works with the help of your friend.
2. Do tumbling works in pair.
3. Do tumbling works in group.

Teaching Instruction:

Praise to encourage the students. Observe the condition of the students. Do involve the students in only a few tumbling works. Observe the play ground and make the students aware of possible accidents. Keep the male position for 8 seconds. Keep in balance in front of hands and legs and guide. Keep in balance the hands and front of legs and ask the students to swim for 8 seconds (8 times). Stand on hands.