GOVERNMENT OF KARNATAKA

ENVIRONMENTAL STUDIES

TEXT CUM WORK BOOK

ENGLISH MEDIUM

5

FIFTH STANDARD

KARNATAKA TEXT BOOK SOCIETY (R.)
100 Feet Ring Road, Banashankari 3rd Stage,
Bengaluru - 85.

Foreword

The protection of our environment is our topmost priority now. The environment that we are discussing here is our natural environment. The role of natural environment in human life is similar to the social environment which plays an important and prominent role in human growth. There is a need to nurture and protect natural environment as our duty. Apart from protecting the existing trees, we need to plant new ones. We also need to develop tanks and take measures to protect all the sources of water. Judicious usage of river water is also the need of the hour. Deforestation should be stopped. A pro people developmental activity and a programme aimed at the protection of environment should not be at loggerheads. We need to have a developmental vision that can ensure our secure physical existence. We need natural environment. Opposing natural environment protection in the name of development or opposing the developmental initiatives in the name of protecting natural environment is not good.

The issue here is about the choice of our developmental model. There is a big difference between the developmental model that seeks to provide basic needs to human beings and a model that seeks to attain development by destroying the Earth and turn it into a barren planet. Hence, we need to have a balanced vision of development.

So, the need of the hour is to foster balanced and sustainable nature oriented thinking in our children. Let them think of development once they are grown-ups. First, let them understand nature and realize the importance of protection of nature. Let them imbibe the importance of nature in their minds through this process. With this good intention, Environmental Studies is introduced from class I itself.

At present, Environmental Studies text cum work book is in usage from class I to class IV. The Government of Karnataka has extended the Environmental Studies to Class V as well in its order dated May 27, 2014. A text book committee was also formed with the mandate of preparing a suitable text book for Class V. Now, a complete Environmental Studies text is included in the Class V. The Social science chapters that were present earlier in the Class V are shifted to Class VI text. Now, the new text book for Environmental Studies for Class V is ready. It is a text cum work book. It is implemented from the academic year 2017-18.

We are indebted to Dr. Eknath Ekbote, the Chairperson of the Environmental Studies textbook committee and also to the members of the committee. The contributions of the editorial committee and the high power review committee are also acknowledged with pleasure. We also thank Smt. N.R. Shyalaja Kumari, SADPI, KTBS, for her efficient work as the subject coordinator.

While remembering all those who have supported this text book preparation work, we sincerely believe that students get benefitted from this text book.

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Chairperson's Speak

The 5th Standard Environmental Studies text book has been prepared based on the guidelines of the NCF-2005. In this text book Science and Social science topics are integrated and it is a continuation of 1 to 4th standard Environmental Studies. It paves way for learning the concepts of 6th standard science and social science. Considering the age and mental ability of the child, care has been taken to use simple language in this text book.

Based on the theory of constructivism, importance has been given to the construction of knowledge of the child. Ample opportunities are given to develop love and concern towards environment through observation/discussion/activity/experiments with daily experiences. Local examples, situational illustrations, maps, charts are given to help the child's learning. Teachers have to guide the children to use them properly. We hope that the box items like **know this, Think** promote the child's self-learning and participatory learning which leads to meaningful and permanent learning.

Experienced teachers, subject experts, artist and scrutinizer have made a sincere effort to prepare this text book. I am very grateful to them. I express my grateful thanks to the members of editorial board, members of high power committee and officers of Karnataka text book society who have given their valuable suggestions/guidance for the preparation of this text book.

Suggestions and comments from teachers, parents and those who are interested in education are always welcome to improve the quality of this text book.

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CONTENTS

LESSON - 1

LIVING WORLD

Protection of environment is the duty of all. You must have heard this saying. The word environment is very familiar to us. The things around us is environment. We can enjoy environment by seeing only. We see hills, forest, river, falls, streams, honey bee, insects, eagle, snake, soil, light, birds and so many other things around us which make us wonder. This is our environment. Our environment is home for diversity. You have the curiosity to know the speciality of this diversity. Haven't you? If so, understand this unit.

After studying this lesson you,

- identify living beings and nonliving things.
- know the important characteristics of living beings.
- introduce yourself to the method of food production in plants, life cycle and different types of plants.
- classify animals based on their feeding habits.
- know the importance of protection of plants and animals.

Read this story - Lazy Somanna

Somanna is a lazy person. Even though he owns a piece of land, he has not worked for a single day in his land. He used to live only by receiving what others gave him. He was very fond of groundnuts, especially fried groundnuts. Once while eating fried groundnuts he got an idea. He thought that if he sowed groundnuts in his land, he would get enough groundnuts to eat and he need not beg anybody for it. Also he felt that if he sowed fried groundnuts, yield would be fried groundnuts. So there would be no need to fry the groundnuts. Not knowing the type of seeds to be sown, Somanna started sowing fried groundnuts from the next day itself. Seeing Somana working in his land, the neighbouring farmers were very happy that Somanna had shed his laziness finally. Days passed. Plants grew and greenery was everywhere. But not a single plant appeared in Somanna's land.

Think : You have read the story. Why did plants not grow in Somanna's land?

Raw groundnuts have the characteristics needed to grow into a plant. It is called living component. In fried groundnuts the living component is destroyed. It is called the nonliving state. In the environment, there are living beings which have the living characteristics and non-living beings which do not have the living characteristics.

In the following chart some components of the environment and some living characteristics are given. Read carefully. If in each of the component the characteristics given in front of them are found, put (✓) mark. If these characteristics are not found put (×) mark.

Components of the environment	Characteristics						
	Growth	Eating food	Movement	Respiration	Excretion	Response to stimulus	Reproduction
mouse							
mango							
brick							
clock							
butterfly							
man							
frog							
paper							
mobile							

The components which you have marked (✓) are called living beings and those which you have marked (×) are called nonliving things in environment.

Some of the components seen in environment are given below. Identify them as living beings or nonliving things. Put (✓) mark in front of the correct choice.

Components of the environment	Living beings	Non living things
birds		
balloon		
water		
mango tree		
vehicle		
pen		

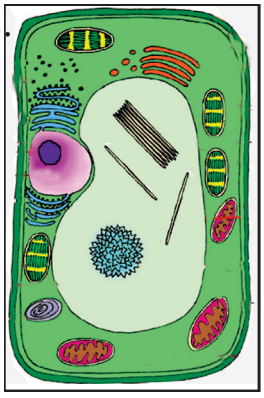
Activity: *Make a list of other living beings and non living things you have seen.*

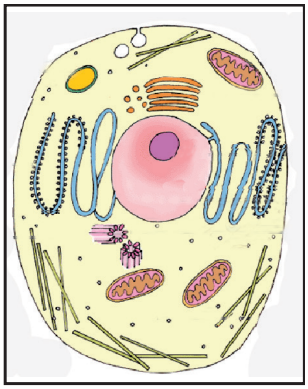
_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

Plants and animals are living beings. There are certain characteristics to decide them as living beings.The characteristics of living beings are given here. Know about this.

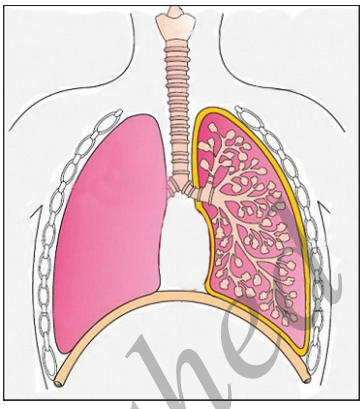
1. Living beings are made up of cells.





Observe these pictures. They are of plant and animal cells. You must have observed how a house is being constructed. When several things such as bricks, cement, water, steel, wood are arranged in an order a house gets ready. Similarly the body of living beings is made up of cells. You will learn more about cells in higher classes.

2. Living beings respire.



You have learnt in the previous classes that living beings respire.During respiration living beings take in air, use the oxygen and give out carbon dioxide.

Observe the given picture.

Identify the picture and write here.

There are special organs to respire in animals.

Plants also depend on oxygen for their respiration. Usually they respire through stomata (small openings) which are present on the lower surface of leaves.

With the help of oxygen the energy in the food is made available to the living body.

Think : What are the advantages of the energy that is obtained from the food?

3. Living beings eat food.

Living beings perform many activities daily such as wood cutting, carrying load, hunting etc,.

The names of some living beings are given below. They help us to work.

How do they help us? write here.

Living being	Help(work)
elephant	
bullock	
dog	

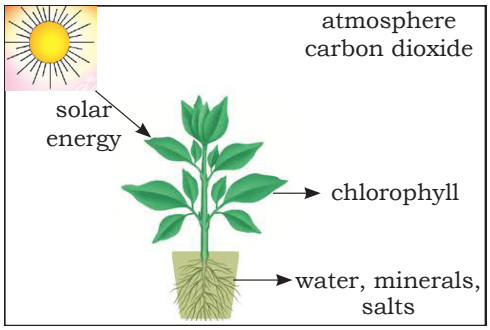
To do all these works, living beings need energy. They get this energy through food.

Food of plants

Each part of a plant does one or the other activity. Don't they also need food? How do plants obtain their food? Think! Yes, green plants produce their own food. That is why green plants are called **autotrophs.**

Preparation of food in plants

Observe the picture. Four important components needed to produce food by the plants are given. An activity, **Which? From what?** is given below. Join the statements correctly and write.



Which?	From what?	Correct and write here
solar energy	green leaf	
water, minerals, salt	atmosphere	
carbon dioxide	sun	
chlorophyll	soil	

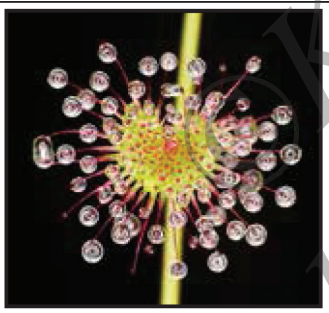
Plants use solar energy, carbon dioxide in air, absorb water, minerals and salts from soil through roots and prepare food with the help of chlorophyll in leaf. This process is called as **photosynthesis**.

In the preparation of food by the plants, glucose is produced and oxygen is released. Write here, the uses of these two for the living beings.

1. glucose _____
2. oxygen _____

Discuss in groups : What would have happened if there is no sun?

Observe the pictures given below. How do these plants obtain their food ?



Though plants like Drosera, Nepenthes, Utricularia prepare their own food, they depend on insects for nitrogen. These are called **insectivorous plants**. You will know about them in higher classes.

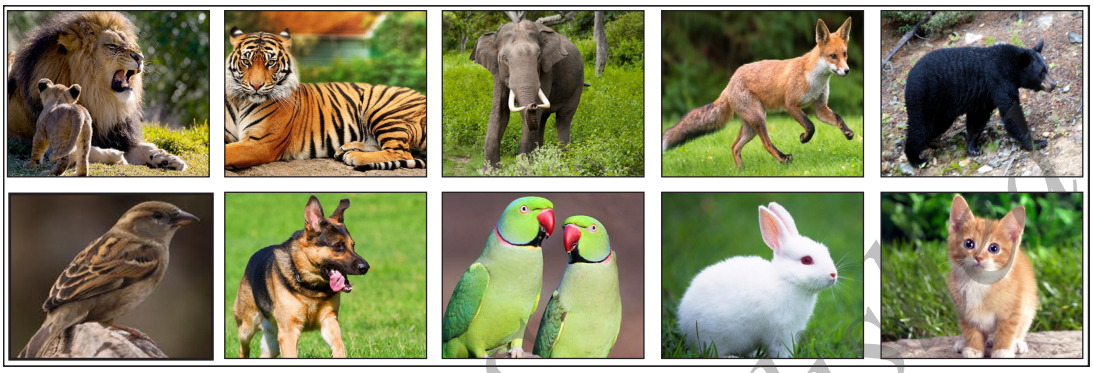
Food of animals

Animals do not prepare their own food. They depend on plants and other animals for food. Therefore animals are called **heterotrophs**.

All animals do not eat the same type of food. Based on the food they eat, the animals are classified as follows.

Herbivore - Animals that eat only plants and plant products.
Carnivore - Animals that eat other animals.
Omnivore - Animals that eat both plants and animals.

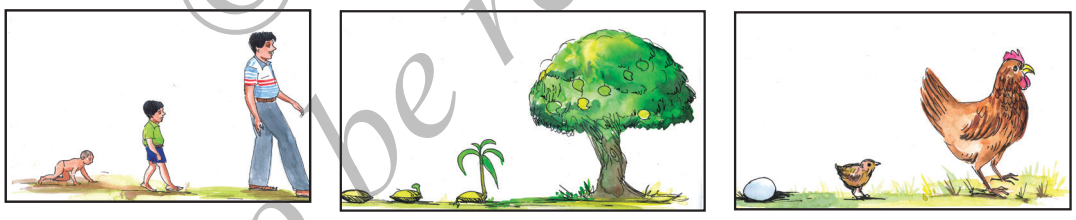
With the help of these pictures list out herbivore, carnivore and omnivore in the chart below.



Herbivore	Carnivore	Omnivore

4. Living beings grow.

Observe the pictures given below



These pictures show the growth of that particular organisms. In every picture there is an increase in height, and size. This is called as **growth**.

Certain statements related to growth are given below. If the statements are correct put (✓) mark, if not put (×) mark. Correct the incorrect statements and write.

* All organisms are small at the time of birth, later acquire definite height and size. ( )

_____

_____

* Growth takes place rapidly in one or two days. ( )

_____

_____

* Plant growth is observed at its stem tip or the size of the stem. ( )

_____

_____

5. Living beings move.

Observe these pictures. Which living characteristic do they indicate?

Yes, all these are related to movement. Movement is a living characteristic, specially of animals.

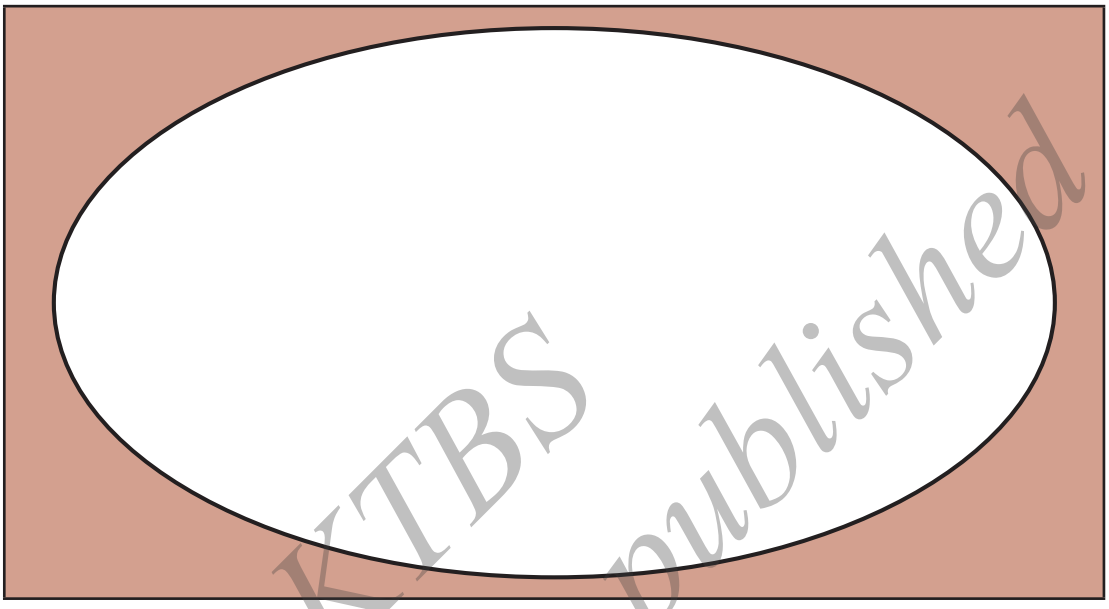
Movement of animals.

Animals move from one place to another. They have special organs for this. Some animal names are given below. Write their organs of movement here.

man _____ eagle _____

kangaroo _____ bat _____

Why do animals move? Discuss in groups and write in the space given below.



Think : Cars and buses run on road. Hands in a clock move circularly. Rivers and streams flow. Do they have life? What is the difference between the movement of living beings and non living things?

Plants do not have organs for movement as in animals. As soil holds the root of plants they cannot move from one place to another. Still we can observe the following movements in plants.

- Roots growing towards water in the soil.
- Sunflower plant turning towards the sun.

Do this : Keep a potted plant in a room. Let light pass in through a window. Observe it after some days. Observe the direction towards which the leaves have bent. Discuss with friends.

Think : If plants had legs like you what would have happened?

6. Living beings excrete.

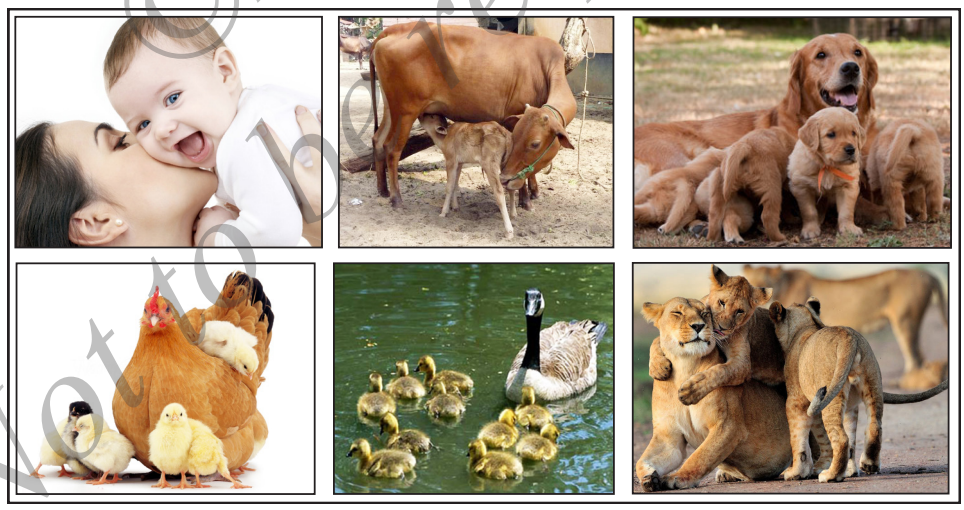
Many activities take place in the body of organisms. As a result, things which are unwanted for the body are also generated. These have to be thrown out of the body. If not body gets affected.

Animals throw out unwanted things of the body in the form of carbon dioxide, sweat, faeces and urine. They have special organs for this purpose.

Plants also give out carbon dioxide during respiration. Dry leaf, stem, rotting parts - all these separate from the plants. They release excess water to the atmosphere through leaves.

Do this : Take a potted plant. Cover the plant with a plastic cover and tie it tightly at the stem portion. Keep it in the sunlight for 1-2 hours. Observe the plastic cover closely. Share your observation in the class.

7. Living beings reproduce.



Observe the organisms and their young ones in the above pictures. Young ones of each organism resemble that respective organism, which gave birth to them. The process of an organism giving birth to young ones which resemble it is called **reproduction.**

Given below are certain statements related to reproduction. If the statements are correct, put (✓) mark. If the statements are wrong, put (×) mark.

Statement	Right/ wrong	Corrected statement
Organisms continue their generation by reproduction.		
Due to reproduction, the other organisms in environment get food.		
Reproduction is seen only in animals.		
There will not be any danger in the environment by over-reproduction of a single organism.		

Some animals carry out reproduction by laying eggs and some others by directly giving birth to young ones.

Activity : List out the animals that lay eggs and those which directly give birth to young ones.

_____ _____

_____ _____

_____ _____

_____ _____

- **Plants reproduce through seeds and stems.**

Activity : List out the plants that reproduce through seeds and stems

_____ _____

_____ _____

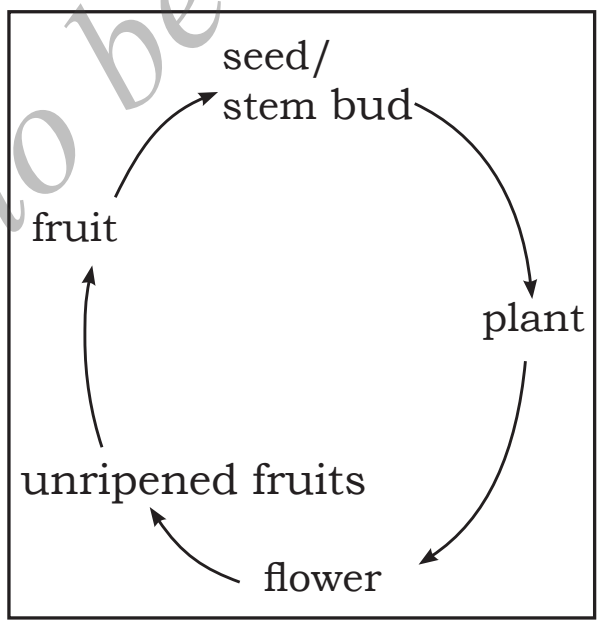
_____ _____

_____ _____

Life cycle of a plant.

Seed is an important part of reproduction in plants. Seeds developing from seeds is one of the wonders of nature. Some plants apart from seeds, produce new plants through stem buds You will learn more about them in higher classes.

A life cycle of a plant producing seeds from a seed is given here. Observe.



Think : Usually reproduction takes place by seeds in fruits. How is the reproduction in a coconut tree? Take the help of the teacher.

Activity : Reproduction of plants is advantageous to animals including man in many ways. Discuss with your friends and list them.

_____

_____

_____

_____

Do this : Collect seeds from plants in your neighbourhood in the beginning of rainy season. Take fertile soil and make soil balls out of it. In each of the soil ball insert a seed. When rain starts, plant them in the soil. Do this every year. In this way some seeds you have put might grow very well in future.

8. Living beings respond to stimulus

When thorns prick our feet we feel pain. We have observed our body shivering in cold, snake hissing in self defence and buffaloes getting into water to cool off during excessive heat. Some insects bite us when we touch them. Animals shout. Like this, organisms respond in their own way. All these are the responses given by organisms to the surrounding stimulus. Living beings respond to the changes in their surrounding environment. Usually they respond to touch, heat, cold, sound and smell. They have special organs for these.

Observe the pictures. Folding of leaves when touched, in **touch me not** plant, stinging of **scorpion** when some external thing touches it, flower of sunflower plant turning towards the sun- these are the ways that organisms respond to stimuli.

Think : A calf jumping when it sees mother cow, mother bird crying in distress when young ones are not found in the nest, a mother hen protecting its chicks either by covering them with wings or attacking the cat or eagle to protect the chicks-all these exhibit animal feelings. Think and list out the feelings of different organisms.

_____

_____

_____

9. Living beings have life span.

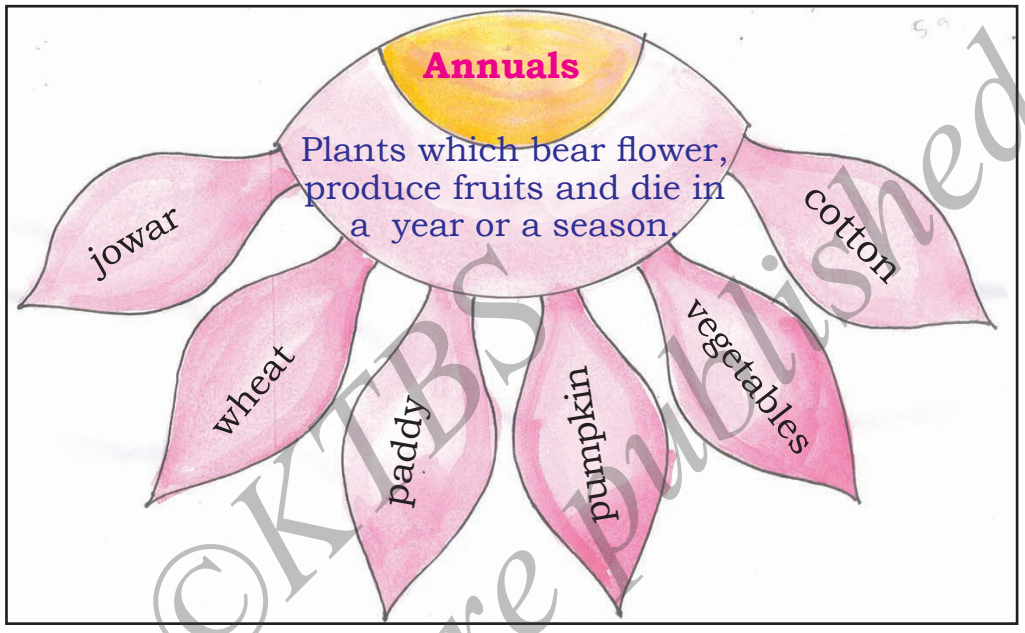
Organisms take birth, become adults, reproduce, become old and die at last. The period between birth and death of an organism is called **lifespan**.

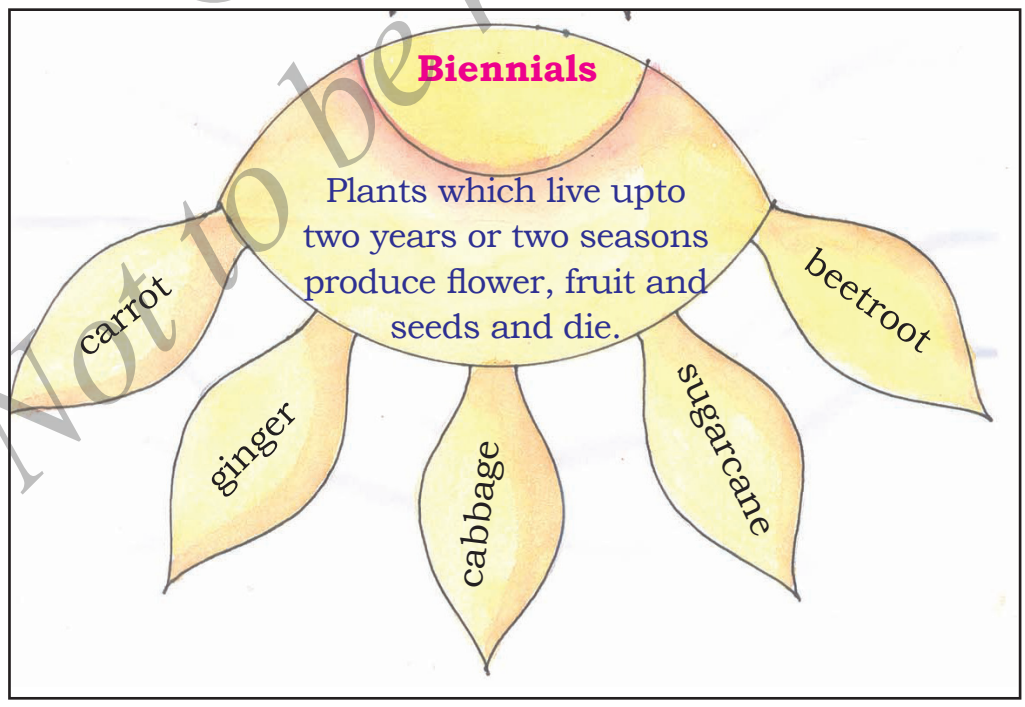
The average life span of some animals are given below. Observe.

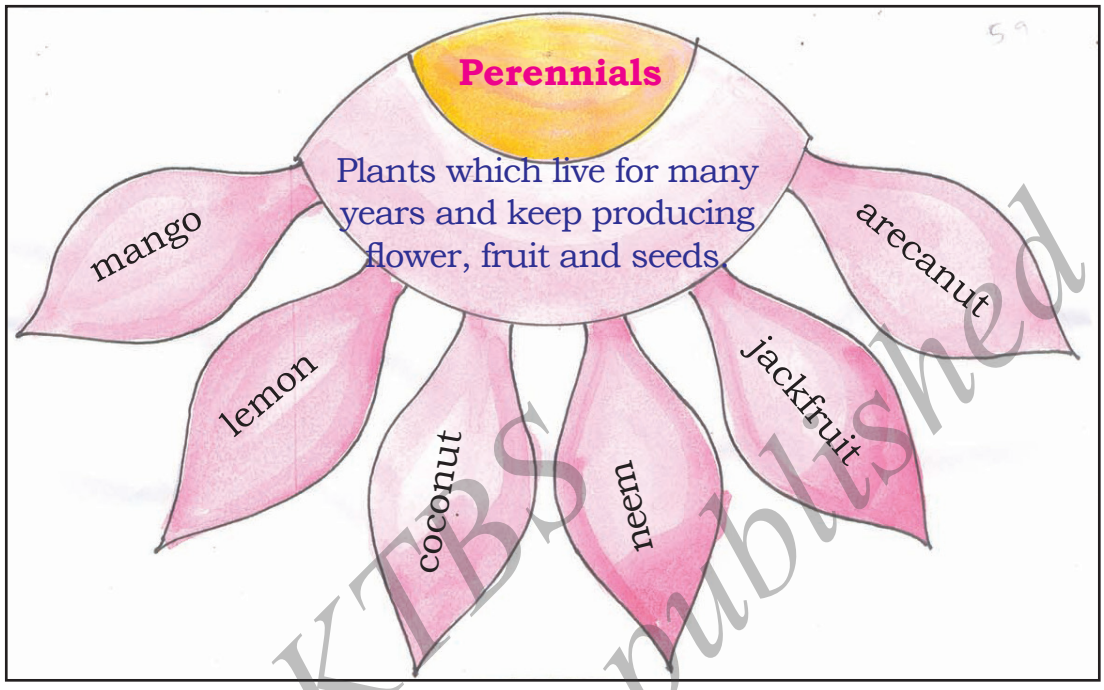
Animals	Average life span (in years)
turtle	150
elephant	70
cow	20
eagle	20
man	70-80

Based on the life span, plants are classified into **annuals, biennials** and **perennials.**

Understand it through the following pictures.







Write the uses of the plants given below

Annuals

1. _____

2. _____

Biennials

1. _____

2. _____

Perennials

1. _____

2. _____

Apart from the life span, plants are classified based on the nature of seed leaf as monocotyledonous and dicotyledonous plants.

Do this : Take ragi and groundnut seeds. Put them into two separate water filled glasses before going to sleep. Next day morning drain the water. Press tightly the ragi and groundnut seeds with your hands. Share your experience.

Monocotyledonous seed has only one cotyledon (seed leaf).

Example : Jower, ragi, wheat,paddy, millets.

Dicotyledonous plant seed has two cotyledons (seed leaf).

Example : horse gram, groundnut, redgram, bengalgram, blackgram

Do this : Collect monocotyledonous and dicotyledonous plants from your locality. Observe their leaf and root. Know the difference with the help of your teacher.

You have learnt about the characteristics of living beings. Plants and animals are two important components of the environment. But now-a-days their number is decreasing as a result of man's greediness. Protection of plants and animals is the need of the day.

Why should we protect plants?

- For rain, - For food, - For future generations.

Discuss with your friends about the methods of protecting plants.

Importance of animal protection

Read the incident given below.

Once in Borneo, there were too many flies. Insecticides were used to control them. All flies died. Lizards started eating the dead flies. As a result, the insecticides, in the body of the flies, entered the lizard's body. Their movement slowed down. Now cats could easily hunt them. The insecticides which entered the body of cats through lizards turned poisonous for them and many cats died. As the number of cats decreased, the number of rats increased enormously. Because of this, plague disease erupted and caused the death of many people. Government had to import cats from other countries.

This incident, conveys the importance of animal protection and balance of living beings in nature.

Many more points about the importance of animal protection is given below. Read them.

- Animals play an important role in maintaining the environmental balance.
- If animals are destroyed, it affects other organisms as there will be scarcity of food.
- In the recent years, the Government has taken measures to protect animals through national forests, wild life sancturies, bird sanctuaries and reserved forests. Hunting is banned.

Activity : List out the national reserve forests, wild life sancturies and bird sanctuaries in Karnataka.

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

The living world around us is a wonder. Knowing about the plants and animals, we should protect them.Then only the existing environment we see now will be available to the future generations. Remember always that **if we protect nature, it will protect us**.

LESSON - 2

FAMILY

You already know that the members of a family are related to one another and live together. Sometimes, the members of a family, leave the main family for various reasons like marriage, job, education, etc, and make their own separate family. Over the years, there has been a number of changes in the structure of a family.

After studying this lesson you,

- understand the importance of a family.
- get introduced to your family using a family tree.
- develop the skill of identifying relationships based on signs.
- identify the changes in the structure of a family.
- understand the features of nuclear and joint families.

You have been introduced to the family tree in class 4 itself. What is a family tree? Write the answer in the space provided.

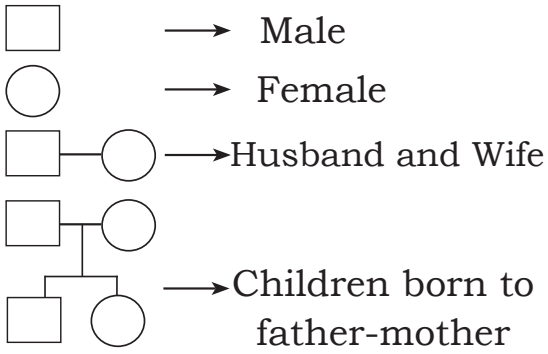
_____

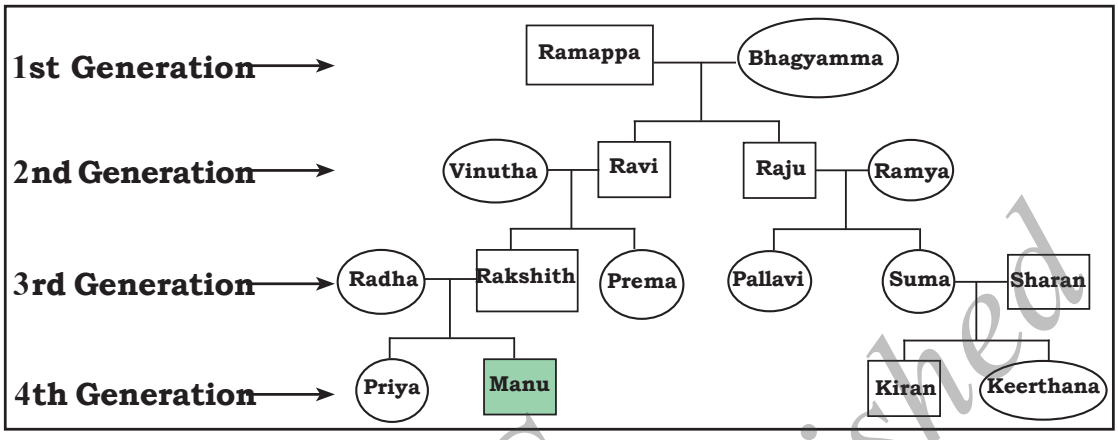
_____

Family tree

I am Manu. I will introduce my family through the family tree. My family tree is in the next page. In this, I am in the green square. Read the names of all my family members.

The signs used in the family tree





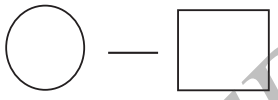
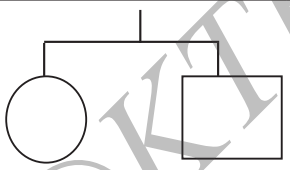
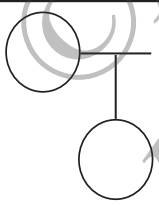
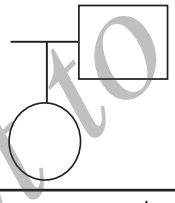
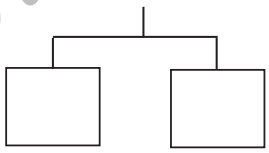
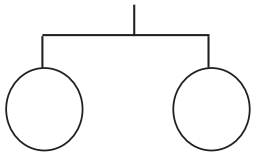
The names of the family tree above, are given in the list below. Imagine that you are **Manu**, write the relationship of the persons given in this family tree.

(Observe the example of Sl. No.1)

Sl.No.	Name	Relationship
1.	Priya	elder sister
2.	Rakshith-Radha	
3.	Prema	
4.	Ramappa, Bhagyamma	
5.	Ravi, Vinutha	
6.	Pallavi	
7.	Sharan, Suma	
8.	Raju, Ramya	
9.	Kiran	
10.	Keerthana	

Think : Is Prema's and Manu's relationship the same with all these people.

While drawing the family tree, □ symbol for men and ○ symbol for women have been used. Look at the symbols given below and name the relationship.

Sl.No.	Sign	Relationship
1.		wife-husband
2.		
3.		
4.		father-daughter
5.		
6.		elder sister-younger sister

You have been introduced to my family. Now, you draw your family tree.

Compare your family tree with mine and answer the questions that are given below :

1. How many generations are there in my family?

_____

2. How many generations are there in your family?

_____

3. Which is the bigger family of our two families? How?

_____

There are four generations in my family. All of us live together in the same house. All of us have our meals together. We celebrate festivals and other functions together. We all get the love of our great grandfather and great grandmother. All of us take care of them with respect. My family members do all the work with their guidance. This type of a family with more than 2 generations, living together in the same house is called as a joint family.

In my aunt Prema's family, only four members are there. Prema aunty, Ashok uncle and their two children. Prema aunty's Mother-in-law and Father-in-law live in a different city. Hence their family is a small family. This type of a small family with only two generations living together is called as a nuclear family.

Do you want to know the type of your family?

Then put (✓) or (×) marks for the following family features. If you have more of (✓) marks, then your family is a nuclear family and if you have more of (×) mark then your family is a joint family.

Sl.No	Features of the family	Yes (✓)	No (X)
1.	There are 2 generations in my family.		
2.	We are all related.		
3.	The elders in the house are father and mother.		
4.	The size of my family is small.		
5.	All the children of the family are unmarried.		

With the help of the above features, we come to know that my family is a _____ family.

Do you know this?

- While preparing a family tree, the names of children are written according to the seniority.
- In a family tree the names of the children of that family from the eldest to the youngest is first written and then the names of their husband/wife are written.
- The word **family tree** indicates that many generations spread out and grow just like the many branches of the tree. But while drawing a family tree it is written from the eldest to the youngest from top to bottom. It is written this way, to denote the younger generations after the older generations.

Now, I will introduce my friend's families to you.

Come, let us see my friend's family. His family is a joint family.

You have seen my friend's family. Write your opinion about his family.

_____

_____

_____

Write the similarities and differences you have noticed so far among my, your and my friend's families.

Similarities	Differences

My friend's family is a joint family. Discuss with friends and write the advantages and disadvantages of this family.

Sl.No	Advantages	Disadvantages

Now, let us go to the house of another friend of mine. Her mother is telling something. Let us listen to her.

I grew up in a big family. There were 25 members in my family. Everybody took the responsibility of nurturing and taking care of the children. When I was young, grandmother used to tell stories. My grandfather told me how to behave. But now, in my family we are only me, my husband and my two children. Now I have to take lunch to my husband who is hospitalized. Where do I leave my small child? This is my worry now.

Her neighbour Razia didi has come now. Let us listen to what she will say.

Don't worry. Leave your little child in my house. I will take care. We should help one another, when we are neighbours, shouldn't we?

Did you hear? My friend's mother's worry has been solved. Then, who is there to help your family? Write the various types of help they have done for your family in the space provided.

Who?	What type of help?

Think : Have relatives/friends who live in a far away city ever helped you?

I have introduced you to different families. Read the below aspects and differentiate as **my family** and **others**. Write the differences in the boxes provided in the next page.

- Taking care and protection
- Give the required education.
- Provide provisions for food.
- Teach lessons.
- Consoling if we lose in the game.
- Provide treatment when sick.
- Show love and affection.
- Provide necessities.
- Support when mother is not there.
- Spare lots of time.

My family	Others

Along with the members of my family, others and neighbours also help us.

Activity : Visit 10 houses in your neighbourhood. Write down the name of the head of the family in every house and mention the number of members in that family. Observe the example. Fill in the information in the format as shown.

Sl.No	Name of the head of the family	Number of members in the family	Who are they? Give the relationship with the head of the family
Example	Ramanna	6	Father,mother,wife, son, daughter
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Answer the following questions, based on the above information :

1. Number of families which have less than 5 members

   _____

2. Number of families which have more than 5 members

   _____

3. Number of families which have 2 generations _____

4. Number of families which have more than 2 generations _____

5. After doing this activity, I learnt

_____

_____

_____

_____

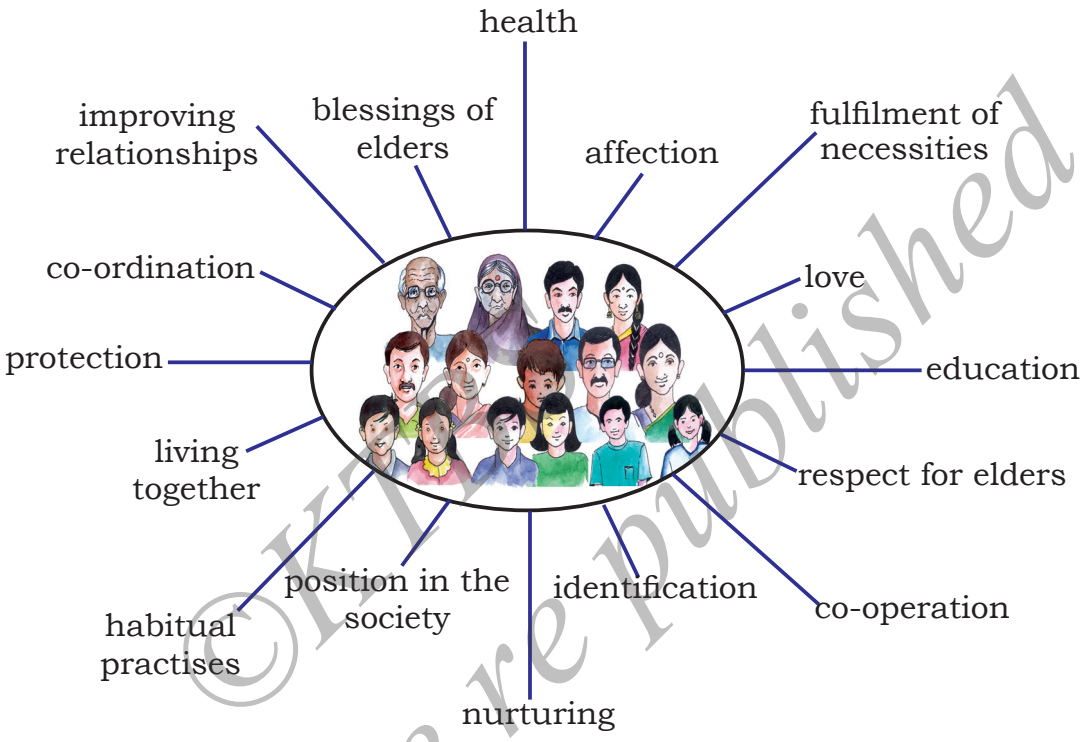
_____

Know this : Now a days, due to reasons like job, income, education, life style, etc., a lot of changes are taking place in the structure of a family. Nuclear families are increasing.

Sing and enjoy

Open the door and you will see,
Mother,father,sister and me,
We are a little family of four
Who live and eat together for sure.
I love my family, Oh! yes I do,
My mother, father and sister too.
They play with me and take me out
They love me too and I love them.
My life I cannot think without,
My lovely little family of four.

■ **Answer the following questions with the help of the picture given below:**



1. What are the good qualities I learn from a family?

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

2. Why do I need a family?

_____

_____

_____

_____

_____

LESSON - 3

COMMUNITY

Group of people living in a specific area is called a community. Members of the community are interdependent on each other for many things. Community is called with many other names.

Example - Rural community, Urban community, Tribal community.

After studying this lesson you,

- recognize the features and types of communites.
- know about rural community, its occupations, problems of rural people and solutions for them.
- know about the life style of urban people, their problems and solutions for them.
- get introduced to the tribal community.
- appreciate the dignity of labour by understanding the need of different occupations and their values.
- recognize the assistance of the community during natural calamities.

Different communities

Here is a picture of a village. Look, Don't you see many houses?

There are many families living in this village. The group of all these families is called a community.

Think : Many families from different places have come to participate in a big fair. Can we call it a community?

Read the story of Ravi and answer the questions that follow.

Ravi's house is in Anandapura. His father was born and brought up in that village. Likewise many people have been living in the village for many years. When there is a funtion in someone's house, then everybody help. Being a farmer, Ravi's father is dependent on others to get his work done..

What are the features of a community? (Any three).

_____

_____

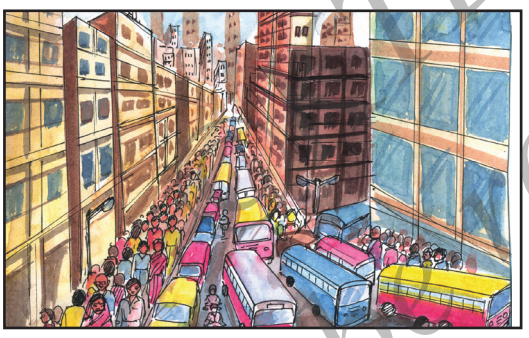
_____

Know this

- Group of people living in a particular place with **we feeling** for a long time is called a community. Every member of the community will have the feeling of dependency on the community. The feeling of dependency is more, if the community is small. This feeling decreases as the size of the community increases.
- It is found that most of the animals in the environment live in groups and it forms their community. The speciality of honeybee and ants is that they live in a community and distribute the work among themselves. Identify the communities of living beings found around you and discuss about it with your friends.



Write the aspects identified by you in the pictures, given.

	Identified aspect
Rural community 	_____ _____ _____ _____ _____
Urban community 	_____ _____ _____ _____ _____
Tribal community 	_____ _____ _____ _____ _____

There are different communities like rural community urban community and tribal community.

Here is a picture of a rural community. You can see many activities in the pictures. Differentiate agricultural activities and non agricultural activities and write them separately in the space given below.

Agricultural activities	Non-agricultural activities
______________________	______________________
______________________	______________________
______________________	______________________
______________________	______________________
______________________	______________________

Each family in a community needs many things and equipments for their day-to-day activities. Interdependence is found more in rural communities. People respect all occupations.

Activity : Make a list of implements required by a farmer for agricultural activities. From whom do we get them? Write it in the space given below.

Equipment	From whom?

In India, 72% of the total population live in villages. Agriculture is the major occupation of 70% of these people. Along with agriculture other occupations like dairy (rearing cow, buffalo), poultry, fishery, sericulture etc,. are also done. We also find occupations like **weaving, blacksmithing, carpentry, basket weaving** and others in villages. Agricultural activities are totally dependent on rain. Villages have problems related to hygiene, health, education and jobs. The Government has introduced many rural development programmes. They are -

1. Rozgar Yojana and Jawahara Gram Samruddi Yojana for the educated youth in villages for self employment.
2. Sarva Shiksha Abhiyana to give quality education.
3. Nirmala Grama Yojana for the cleanliness of villages.
4. Bhagyalakshmi Yojana for the better future of girls.
5. Ashraya Yojana to provide free sites and grants and loans to build houses for the poor.

Answer the following questions each.

1. Write the various occupations found in villages.

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

_____ _____ _____ _____

2. What are the problems faced by people in villages?

_____

_____

_____

_____

_____

3. Write about any one programme, implemented by the Government for rural development.

_____

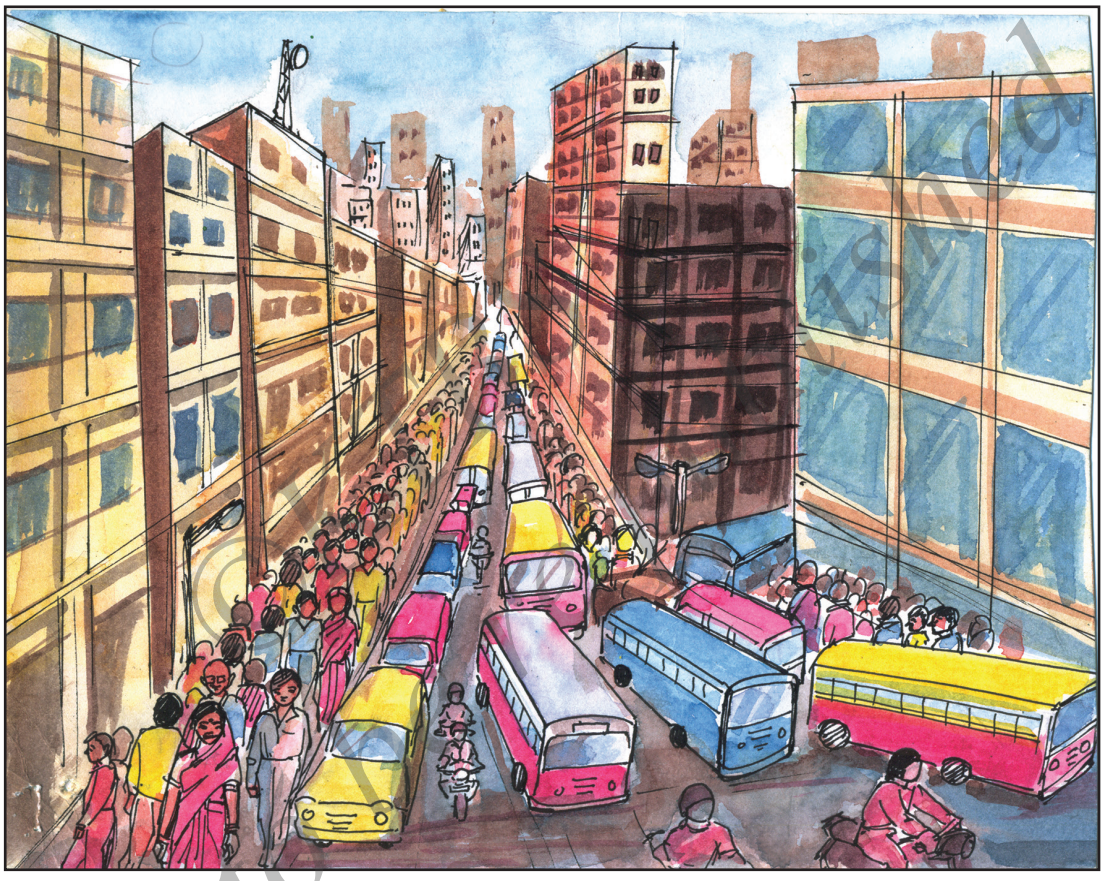
_____

_____

_____

Urban community

Here is a picture of a mega city. What do you see in the picture? Make a list of them in the space given below.



_____

_____

_____

_____

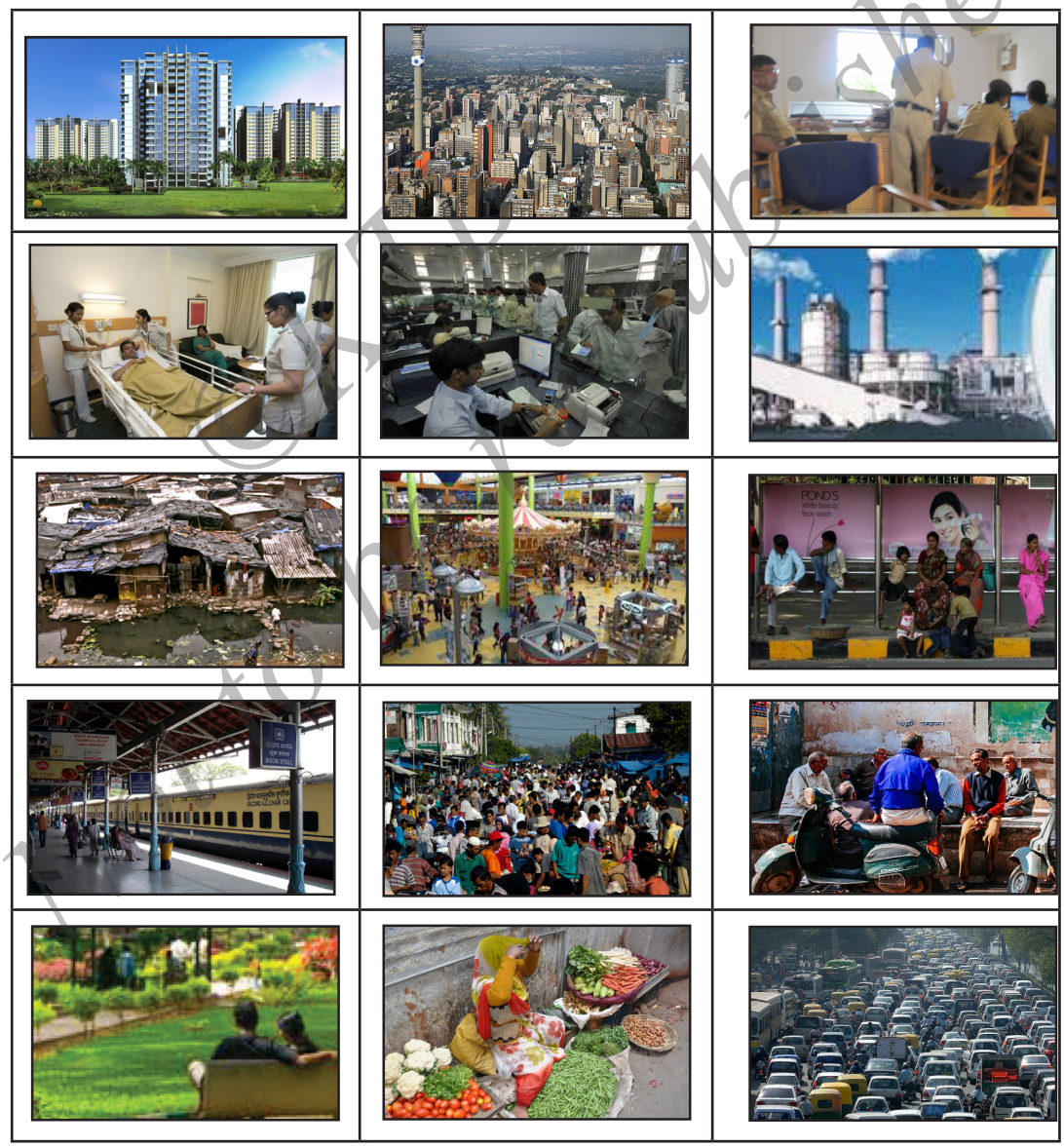
People migrate to cities in search of jobs and for better education. People in cities are engaged in different occupations.

Look at the pictures given below. Write what kind of jobs these people are engaged in? If you find the people engaged in these occupations in your locality, put (✓) mark.

India has nearly five thousand cities. There are 27 cities with a population of one million or more. Bengaluru, our capital city is one among them.

Here are some pictures which give a complete picture of a city. Look at these pictures and answer the questions that follow.








1. What do you see when you visit a city?

2. Some of the pictures are related to environmental pollution. Put (✓) mark against them.

3. What are the problems you face, if you are living in a city?

4. Discuss the environmental hazards due to the development of cities?

_____

_____

_____

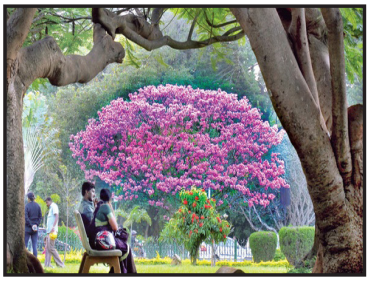
_____

Discuss the given topics with your friends under the guidance of your teacher. Present it to the class.

- Housing problem in cities
- Traffic jam
- Pollution in industrial areas
- Disposal of garbage
- Slum areas
- Water pollution

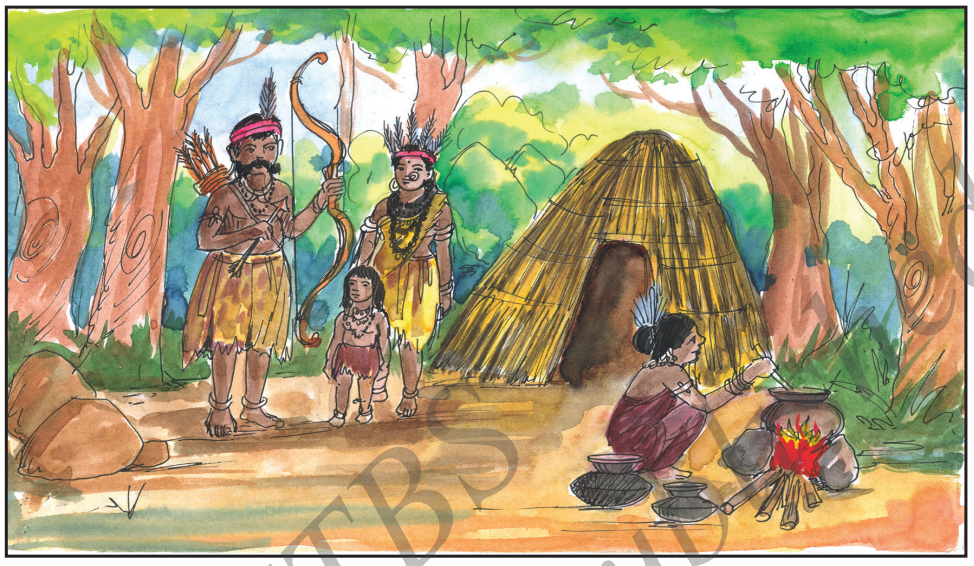
The Government has undertaken many programmes to solve these problems.

Underground drainage system	
Supply of pure drinking water	

Well equipped bus stations and railway stations	 
Ring roads in the out skirts of the city	
Developing gardens	

It is the responsibility of every citizen living in the cities to keep the cities clean. They should co-operate with the Government to maintain the cleanliness of the city. People should live with co-operation, love and friendship.

Tribal community



Observe the picture and explain how it differs from your environment. Write it in the space given below.

_____

_____

_____

_____

_____

Families living in dense forests or hilly areas are called Tribal community. The living conditions, language, dress, and marriage system of the tribals are distinct. In Karnataka, Soligas of Mysuru district, Koragas of Dakshina Kannada, Jenu kurabas and Yeravas of Kodagu district are the tribal communities.

Identify the occupation of the tribals in the given picture and write them in the space given.

_____

_____

_____

_____

_____

Since tribal communities live in forests and hilly areas, they are deprived of health, residence, education, transport, food, and electricity facilities. The Government is trying to provide education, food, house and health facilities to these people in the recent years.

You know that a group of people living together to fulfill their basic needs and to help each other is called a community. Different types of communities can be seen in rural, urban and tribal communities.

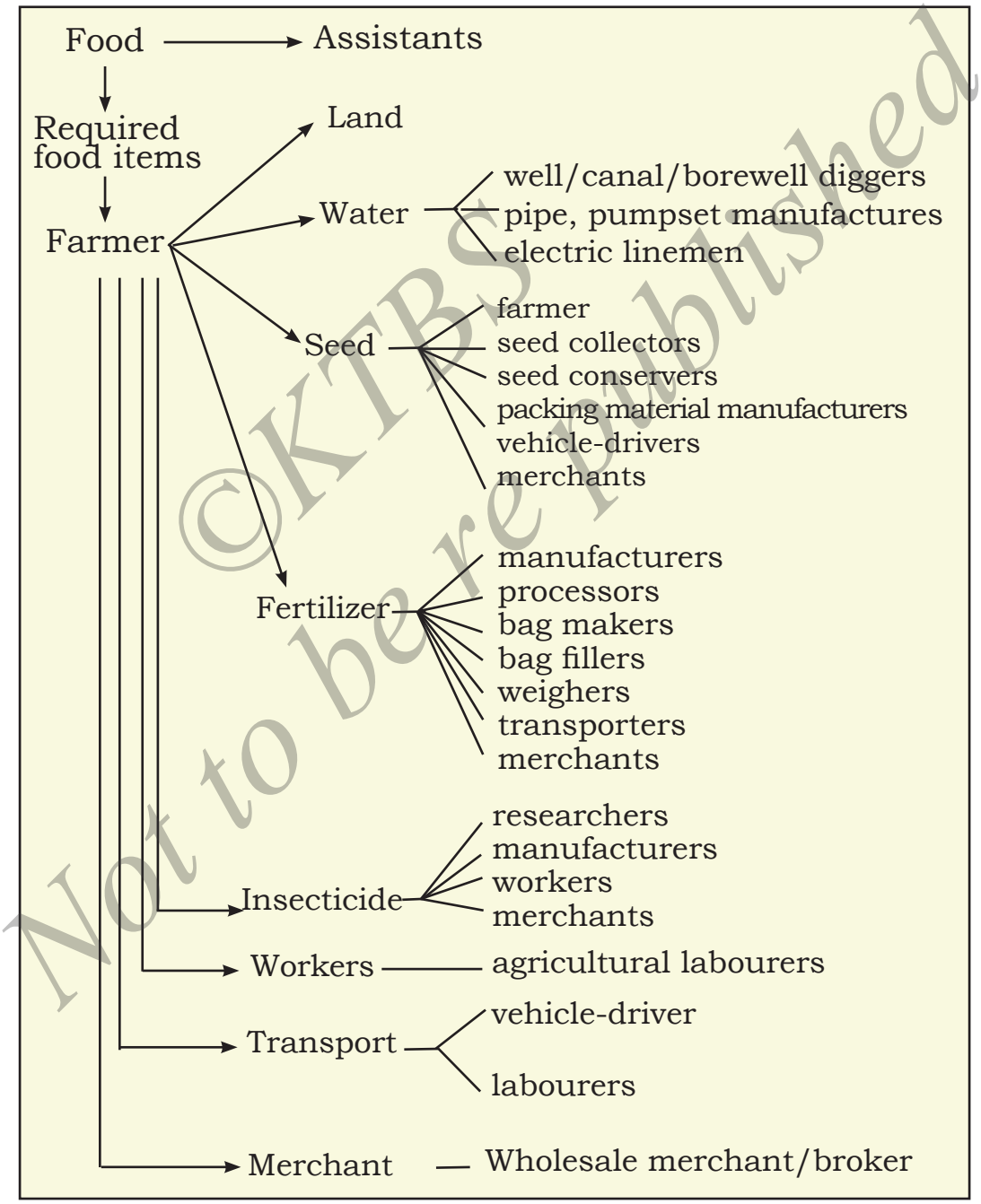
Know this

Different types of Communities

- Community of like minded people come together to exchange their ideas and opinions. **For example,** Community of people interested in folk lore and arts
- Community of people who work together to bring change or to achieve something in their endeavour. **For example,** community of nature lovers.
- People belonging to the same profession or same vocation come together to form a community. **For example,** community of teachers.

Like this, people get together because of their interest, time, leisure, practice, occupation, and hobby. They form their own communities. Communities are not only formed among families but also between persons because of their individual relationships. Apart from these, caste, religion, aim, language, culture, age and sex, etc., are also basis for formation of communities.

You have already learnt about the jobs/occupations. Do you know how many people help to get the food you eat? Observe the chart given below and write what you have learnt from this.



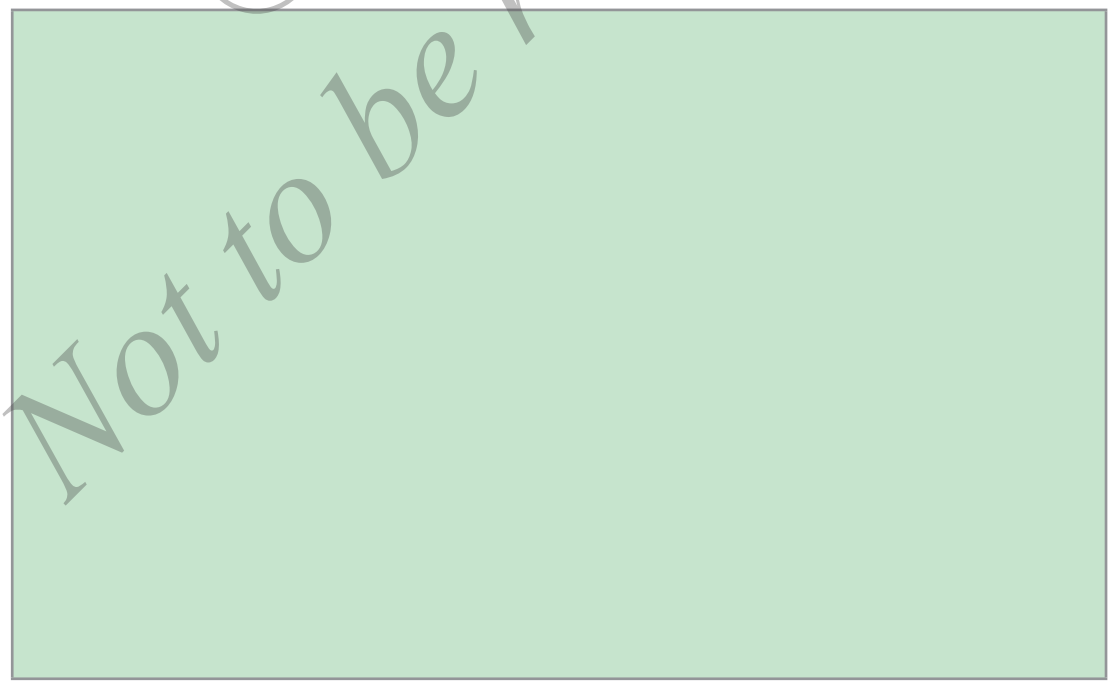
_____

_____

_____

Wow! how many people have worked to get the food we eat. Then think of those people who toiled behind the manufacturing of clothes we wear, building houses we live in etc., Work will not be completed without a single person in this chain. We should not think, that we can buy anything easily by paying money. We should not forget that many people have worked hard for the production of goods and food items we use. We should respect each and every job/occupations and also respect each and every person in the community.

How do we get salt which is prepared by sea-water. Make a chart of persons who help produce salt and distribute it to the people. (Take the help of your teacher)



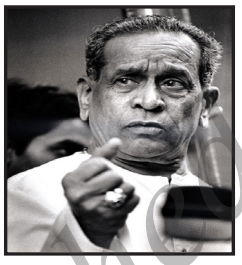
You know that, there should be different occupations for the development of a community. With the occupations which provide basic needs of the community, there are people who follow other proffessions in a community.

Look at the pictures. Who are they? How are they useful to us? Write it in the space given below the pictures.

In a community, along with people who manufacture and supply things, people who clean the environment and people who provide the basic necessities of life, we also need people who entertain, give happiness, give information and relief. Eveybody in the community has to contribute for its development. Every occupation has its own value and we should respect everyone.

Here are pictures of some achievers. Who are they? Can you identify and write the field of their achievement.



_____ _____ _____

_____ _____ _____

- Collect pictures of persons who have excelled in different fields. Exhibit them in the classroom.
- Which occupation would you like to choose when you grown up? What are the advantages of your choice to the community? Share your opinion in your class.

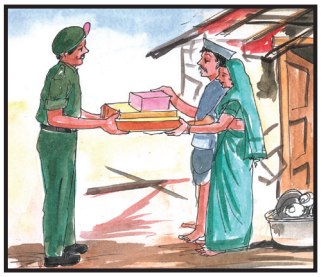
Look at the picture given below. Explain the situation in the picture.

_____

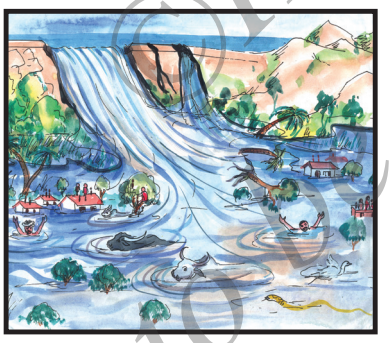
_____

_____

Look at the picture and explain how this family has been supported in different ways.


When somebody in the community is in trouble, others will help them. Likewise if there are natural calamities such as floods, droughts, earth quakes etc., other communities help the affected community




What have you learnt from this ? Write it in the space given.

Every person is a part of the community. Community is formed by every member living in the community. It is not possible to live without the co-operation of the community

So, when situation demands, we should help others in the community.

LESSON - 4

COMMUNITY - GAMES

The community has given rise to games. To relax and spend free time, people have made games, a means. Games build the relationships among individuals in a community. It provides an opportunity for elders and youngsters of the community to play together. Games are nothing but activities that people have formed for entertainment and physical exercise. This has definitely increased the harmony in the community by being responsible for all to play and enjoy together.

After studying this lesson you,

- become aware of the importance of games and excercises.
- get introduced to adventure games.

Sunday is a holiday to school. You are in a holiday mood. How will you spend your time on a holiday? Write all that you will do on that day.

- _____
- _____
- _____
- _____
- _____
- _____
- _____

Among these identify the activity which will give you maximum happiness. Is there a game in it?

Then, observe the list given below. Pick the uses of games from the list and write.

• happiness • writing skill • development of intelligence • co-operation	• entertainment • competitive spirit • attitude to accept both success and failure equally.	• hunger is pacified • Protection of environment • physical exercise • friendship • knowledge

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Observe these pictures. These people do this everyday without fail. Write what these people are doing.

_____

_____

_____

_____

	_____ _____
	_____ _____

Physical and mental health will develop, if games, yoga and physical excercises are done as per the need regularly.The body will be strong and the weight of the body can be maintained. The body will also look beautiful, if it has a good physical structure. It increases our self confidence. Free time will be utilized beneficially. We can be active and happy always, as games give entertainment and happiness.

Think

- What kind of problems will a person who does not indulge in physical activities have?
- What steps should a heavy person follow, to lose weight according to you?

Are only we benefitted from games?

National and international games help to build friendship and co-operation with other states and countries which helps to improve the bond between different countries.

Write the names of a few international games.

- _____
- _____
- _____
- _____
- _____

Stick a picture of India playing any game with another country, in the space provided below.

See these pictures. Choose the names from the list given below and write. (Get the help of the teacher if needed)

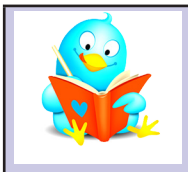
_____ _____

_____ _____

_____

(river rafting, mountaineering, sky diving, rock climbing, mount cycling)

Don't you feel like saying, **Wow!** when you see these pictures? These are also games. They are called **adventure games**.



Know this :

Games which provide excitement and a special experience with special physical competence are called adventure games. These games offer challenge to reach the goal in not so common situations. These games need a lot of preparation, speed, skill, training and physical exercising to meet the new challenges it has to offer. Such games provide a lot of happiness, determination to face dangers, mental stability, physical fitness and entertainment. But they are definitely dangerous games. Hence the cautions given below have to be followed.

- Should not participate in such games without proper training and guidance.
- Before participating in such games, all the necessary special equipment have to be procured and required skills have to be developed.
- Have to behave with a lot of patience and responsibility. Situations will have to be handled with competence.
- Must prepare well ahead and gain sufficient experience to face the threat, harm and dangers of such adventure games by practising well to face the challenges.
- Should participate in the games with co-operation of the team.

Here are given a few pictures of the native adventure games. Write the names of these games with the help of elders.

Collect and write the details of any one adventure game, known to your family members.

- _____
- _____
- _____
- _____
- _____
- _____
- _____

Do you know this?

- The highest peak in the world, Mount Everest was first climbed by Edmund Hillary and Tensing Norgay.
- Bachendri Pal was the first Indian woman to climb Mt.everest.
- Native adventure games reflect our culture but they are being overshadowed by the advent of new technology like TV and internet.
- Wrestling is a sport game which had gained prominence right from the time of the Maharaja of Mysuru. Even to this day, it has remained a part of the Dasara games.
- Cycling, swimming, brisk walking and yoga are some very good excercies. This helps to improve one's health.

LESSON - 5

NATURAL RESOURCES

Our earth consists of essential resources which support life. Water, soil, air, minerals, plants, animals etc., which occur naturally on earth are called resources. These resources are necessary for all living organisms including man. These are the most valuable things in the progress of mankind.

After studying this lesson you,

- understand the need of natural resources.
- know the types of natural resources.
- understand the significance of different resources.
- classify natural resources into renewable and non-renewable resources.
- realise the moderate use of natural resources and their conservation.

Solve the following riddles to identify natural resources.

1. You can't live without me
   Every plant, tree, animal needs me
   Nobody can see me.

   Who am I? _____

2. I occupy major portion of the earth
   I satisfy all your thirst
   I make animal, tree and plant cool

   Who am I? _____

3. I let you live on me
   I help to grow plants and trees
   I support all life on me

   Who am I? _____

4. I give fruits and nuts

I spread cooling shades

No life without me

Who am I? _____

5. Vehicles like bus, lorry and car use me to run

Took thousands of years to form me

From underneath the soil you extract me.

Who am I? _____

6. Plate, tumbler and vessels are made up of me

Beautiful jewels are made up of me

My ore will be hardened by you

Who am I? _____

7. Darkness drives away from me

Bright light comes from me

A source of energy, that is me

Who am I? ____

Generally natural resources can be classified as renewable and non-renewable resources.

1. Renewable resources

Resources like solar energy, air, water, soil, forest etc., are available in nature inspite of their usage. Since these are continuosly available over the period of human life time, these resources are called **renewable resources.**

2. Non-renewable resources

Resources like coal, petrol, diesel, and natural gases will run out due to their continuous usage. Such resources cannot be renewed. Hence these resources are called as **non-renewable resources.**

Put the following resources into the suitable baskets, by drawing lines.

coal
iron
petrol
diesel
cooking gas
water
oxygen
forest
gold
wild animals
solar energy

Renewable Resources

Non-Renewable Resources

You have learnt about the types of natural resources. Let us now know about renewable resources in detail.

Solar energy

Solar energy is the energy obtained from the sun. Sun is the main source of heat and light to the earth. We get light and heat from the sun. You know that plants prepare their food using solar energy.

- Make a list of the activities done using solar energy.

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

Do this : Take two pots filled with soil. Put a bean seed in each pot. Keep one pot in a place with sunlight and another pot in a dark corner. Water the pots daily. Observe the changes after fifteen days. Record what you have observed.

_____

_____

_____

_____

_____

_____

You will learn more about solar energy in the unit **Amazing Energy.**

Air and water are also natural resources. You will know about these in the next units.

Soil :

We walk on soil. We live on soil. Soil is also a renewable resource like water. Soil is necessary for the growth of plants. You already know that plants get water and salts required to prepared their food from soil. You will know more in detail about soil in higher classes.

- **Make a list of activities for which soil is used.**

_____

_____

_____

_____

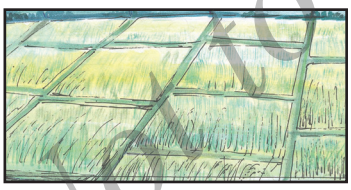
_____

Know this : The outermost rocky layer of the earth is known as crust. Soil is the thin top layer of the crust containing minerals and organic substances. It takes nearly 500 to 1500 years for the formation of about 3 cm of soil. Soil is formed by the weathering of rocks by flowing water, blowing wind and other organisms.

What happens to the top soil in the following circumstances? Discuss with your friends.

- When the wind is stormy
- When there is water current after rain.

The following measures are taken to preserve the top soil from erosion. Observe the pictures. Note down what you have learnt.



_____ _____ _____

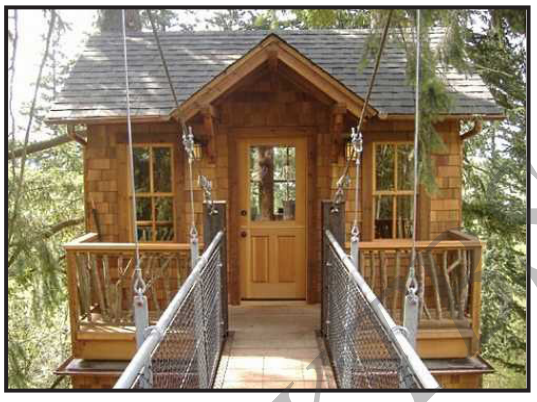
_____ _____ _____

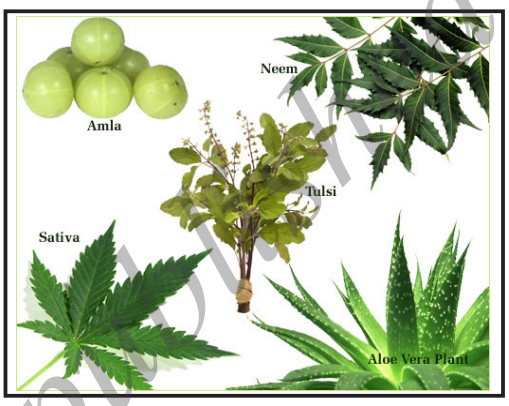
Know this : **Contour farming :** Farming according to the shape of land to prevent soil erosion is called contour farming.

Forests

Forests are the natural habitat of wild animals and birds. They provide the necessary food to the animals and many useful materials to man.

Observe these pictures and make a list of the uses of forests.





- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Discuss about some other uses of forests with your friends

Know this : Forests are also one of the natural resources. They provide fruits, flowers, medicinal plants, wood etc,. Forests are the shelters for tribals. Forests prevent soil erosion (washing or blowing away of top soil). The trees give out oxygen and increase its quantity in the atmosphere. Such useful and valuable forests are being destroyed for various human activities like urbanization, industrialization, construction of dams etc,. We must not forget that **destruction of forests is destruction of life.**

Conservation of forests

Forests can be conserved by restricting unnecessary felling of trees, tree planting, proper usage of forest products, cutting down tree branches causing forest fire etc,. The Government has made amendment to National Forest Policy in 1988 and has taken many steps to nurture and conserve the forests.

Know this

- The Government is maintaining and conserving national forests through the forest department.
- Village panchayath and local community protect social forests.
- National park and wild life sanctuaries - Some forests are identified and preserved along with its wild life. **Example :** Bannerughatta and Bandipura forests are protected by making many laws. Felling of trees, smuggling of wood, hunting wild animals are punishable offenses.
- Some religious beliefs and rituals are also helpful to conserve forests.

  Example : Nagabana of Dakshina Kannada, Devarakadu located in Kodagu. Cutting down of trees is prohibited here.

Many movements have taken place against deforestation when the implementation of several mega projects, were proposed.

Know this

- Panduranga Hegade initiated **Appiko movement** to prevent deforestation in westerns ghats rich in diversified wild life in Karnataka.
- Environmentalists of Kerala successfully stopped a hydro electric power scheme proposed by the Government in silent valley by conducting **silent valley movement**.
- **Save forests (the jungle bachao) movement** triggered in Bihar for the conservation of forests reached even Jarkhand and Odisha and saved many forests
- Sundar lal Bahuguna opposed cutting down of trees by the well known **Chipko movement** in Himalayan region and thus saved many forests.

- Conservation of forests is everyone's responsibility. Why? Write here.

Know this

Salumarada Thimmakka, a proud daughter of Karnataka is known as **Vruksha mathe** throughout the country. Daughter of Vijayamma and Chikkarangaiah of Gubbi taluk, Tumkur district, Thimmakka was married to Bikkala Chikkaiah of Hulikal village and stayed there. Later on, she has planted and protected Banian trees beside the road from her village Hulikal to Kudur with the help of her husband.

Considering these trees as her children, Thimmakka dedicated her entire life for them. Hence centenarian Thimmakka is called **Salumarada Thimmakka.** The Governament of Karnataka has declared a project called **Salumarada Thimmakkana Neralu Yojane** in its budget 2014-15.

Hundreds of awards have been conferred for her immense concern towards nature. The important awards are -

* Nadoja Award - Kannada University, Hampi.
* Karnataka Rajyotsava award.
* Indira Priyadarshini Vruksha Mitra Award - Government of India.
* Parisara Rathna Award

Salumarada Thimmakka is a role model for all of us in the conservation of environment. Her concern towards environment is remarkable and it should be followed by us.

Know this : Animals are also renewable resources. They enhance their population by reproduction. Sometimes hunting of wild animals leads to the extinction of their race and thereby make them non renewable sources. It is our duty to conserve such resources.

You have learnt about renewable resources. Let us know about some non-renewable resources.

Fuels

Fuels are substances which release heat and energy on burning. We use fuel for many purposes.

Example : running vehicles, cooking food.

- Name three fuels used to run vehicles

_____ _____ _____

- Name three fuels used to cook food at home.

_____ _____ _____

Fossil fuels are formed by the remains of extinct plants and animals which were burried under the earth's crust over millions of years. The main fossil fuels are petroleum, natural gas and coal.

- **Petroleum :** Petrol, diesel, kerosene, wax etc., are the byproducts of petroleum. Petroleum is a **liquid mineral** formed beneath the earth. It is formed by the action of bacteria, heat and pressure on dead organisms buried under the layers of the rocks.

The byproducts of petroleum like wax and paraffin are used in making candles, wood polish, ointments, dyes, lipsticks, chemical fertilizers, vaseline jelly, etc.,

- **Natural gas :** Natural gas is found with petroleum in petroleum wells. Compressed natural gas is used as an alternative fuel to petrol and diesel to run vehicles.

Know this : You have seen the use of cooking gas at home. This is called Liquified Petroleum Gas - LPG. It is obtained by refining petroleum or moist natural gas.

- **Coal :** Millions of years ago, the remains of plants and trees that were buried beneath the earth's crust did not decay completely. Due to the high temperature and pressure, they turned into coal under the layers of the rocks. This is used as fuel in the production of electricity. This source of energy is also used in industries.

Write examples for the following.

Solid fuel : _____

Liquid fuel : _____

Gaseous fuel : _____

What measures can be taken to conserve the following fuels? Write here.

Cooking gas	Diesel/Petrol

Know this : Excessive use of fuels is dangerous to the environment. Now-a-days efforts are being made to use alternative sources of energy like solar energy.

Mineral resources

Minerals are formed in the earth as a result of prolonged natural process. They are available along with rocks in the surface of the earth. Minerals are extracted in the form of ore, refined in factories and metals are separated from them.

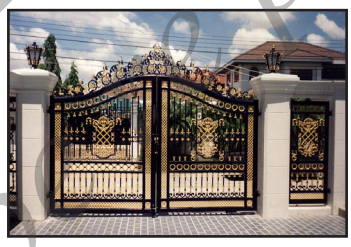
Example : Separation of iron from iron ore.

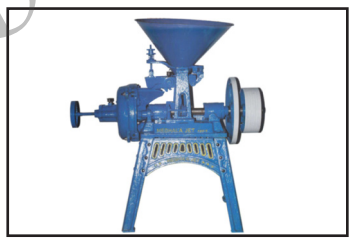
Metals like aluminium, copper, silver etc., are extracted from their ores.

Word help

Mineral : It is a multi useful material available in nature. Its composition can be represented by the chemical formula.

■ **Look at the following pictures and write the uses of minerals.**


Think : What would have happened if there were no minerals?

Explain in your class about the minerals used at your home.

Know this : Regaining of emptied mineral resources depends on the scientific process, that takes place inside the earth. Minerals are formed over millions of years. Hence they must be used moderately.

- Write the uses of the natural resources given in the table

Natural resources	Uses
soil	
forests	
solar energy	
animals	
fossil fuels	
minerals	

- List out the materials used in the construction of your house. Identify by marking (✓) to the natural resources among them. What have you learnt from this activity?

_____

_____

_____

_____

_____

_____

_____

_____

- The availability of natural resources that fulfill our needs is not uniform everywhere. The quality of available resources is also not the same. As a result of excessive usage (more than our requirements) there is scarcity of such natural resources. If the same condition persists, some of the resources may not be available in the future. Hence these resources must be used moderately and they must be reused, if possible.

Know this

- Natural resources are there to fulfill our needs but not to fulfill our greed.
- Natural resources should be used moderately and the balance in nature should be maintained.

Do you know this?

- In earlier days, natural things like mountains, forests, minerals, animals, soil, water etc., were considered as natural resources. Now a days it has got a wider meaning. The meaning of the word resource is changing with time.
- A thing once considered as a resource, may not be considered as a resource after some years.

  Example : Natural gas is a resource now, but it was not so about a thousand years ago.
- Sun light, water, soil available everywhere on the earth are called universal resources.
- If forest resource is used for fire wood and wooden logs, then it cannot be reused again. As a result, forests become non-renewable resources. Growing more trees and moderate use of wood can make the forests renewable.
- Now-a-days, sea water can be converted into pure water for drinking purpose by using some methods. But these methods are very expensive.
- Human beings with innate intelligence, creativity, expertise and aesthetic sense can also be considered as a type of resource.

LESSON - 6

AIR

Air is one of the natural resources. The earth is surrounded by layers of air called **atmosphere.** Air being a mixture of many gases is very essential for sustaining the life of animals and plants.

After studying this lesson you,

- know about the existence of air through experiments.
- know the components of air.
- understand some characteristics of air through experiments.
- understand the uses of air.
- discuss about air pollution, causes and effects and remedies.

- Air is not visible, but its presence can be felt. How do you know that air is in your surroundings?
  Write 3 experiences about it.

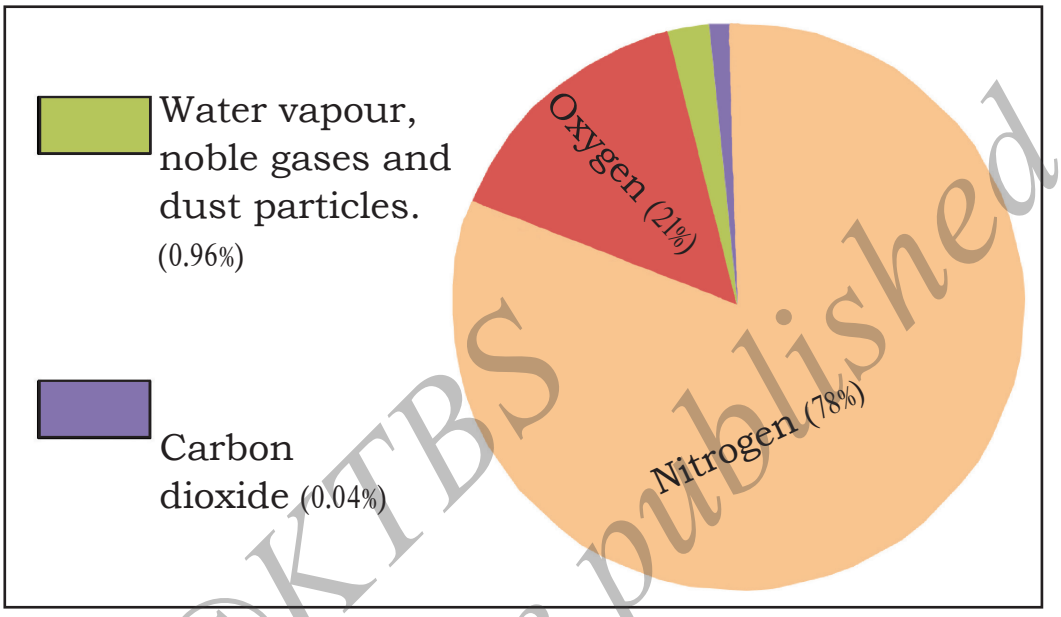
_____

_____

_____

Know this : We use oxygen in air for respiration. We cannot live without respiration. In the same way animals and plants also need oxygen for respiration. Oxygen is necessary for fuels to burn. There are many more uses of air. You will learn about these in the next classes.

Air is a mixture of nitrogen (78%), oxygen (21%), carbon dioxide (0.04%), water vapour, noble gases and dust particles. (0.96%).



Study the composition of air shown in the picture and answer the following questions.

1. Which gas is the major component of air?

_____

2. What percentage of gas required for our respiration is present in the air?

_____

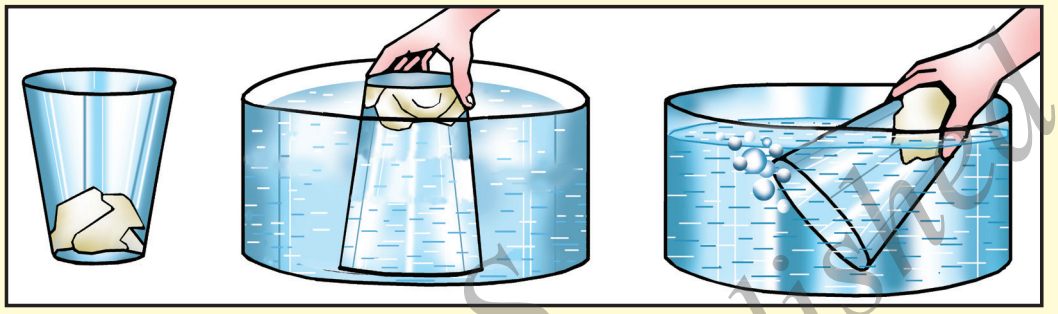
3. What is the normal percentage of carbon dioxide in air?

_____

4. Which is the least component present in air?

_____

Do this : Press a piece of dry paper to the inner bottom of a glass tumbler. Invert the glass and press it carefully in a trough filled with water as shown in the picture.



Observe what happens. Is there water inside the glass? Does the piece of paper in the tumbler get wet? No. Why is it so?

Now tilt the glass slightly. What do you observe? Air bubbles comes out of the tumbler and water goes inside. How does this happen?

An empty tumbler is not really empty. It is filled with air. When it is pressed inversely in the trough filled with water, air comes out and water goes into the tumbler. What do you understand by this activity?

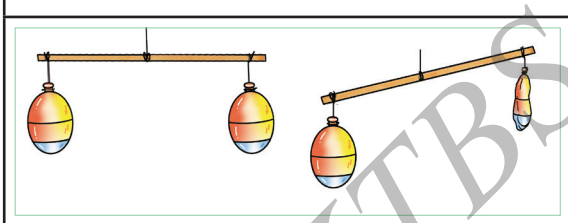
Think : What happens when the tyre of a vehicle gets punctured?

What is being done here to inflame fire in the oven? What do you learn from this? Write here.

_____

_____

■ Match by drawing lines

	Air helps things burn
	Air occupies space
	Air has weight

You will know more about the use of wind energy in the unit **amazing energy.**

Moving air is called wind. Wind has enormous energy.

What do you learn from these incidents?

- Roofs of houses are carried away by strong winds.
- While walking on a street, sometimes we feel the wind pushing us.
- Clothes hung out to dry will flutter when the wind blows.

- A vehicle cannot move if the air inside the tyre comes out.
- Coconut trees swing in strong winds.
- Kites fly up in the sky.

Air is polluted by the smoke released by factories, automobiles, burning of substances and crackers.






Mixing chemicals, dust, micro organisms which are harmful to man and other organisms into air is called **air pollution.** Air gets polluted when chemicals and micro particles of smoke from industries and vechicles mix up with it. It causes serious

health issues like heart disease, cancer, breathing problems etc., It has a negative impact on growth of plants and their yield. Some animal races may get extinct. Since all organisms need air, it is necessary to prevent air pollution. So we must take measures to stop air pollution.

- Write any two measures to prevent air pollution. (Get the help of your teacher/elders)

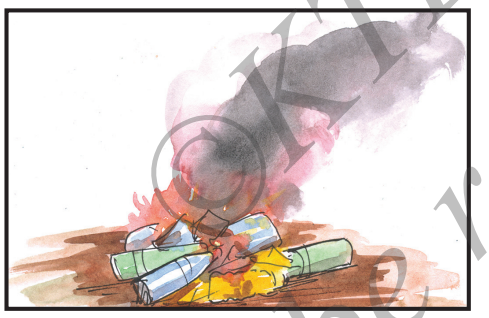
_____

_____

Know this : Some of the measures to be followed to prevent air pollution are as follows.

- Preventing the mixing up of chemical wastes discharged by factories, with air.
- Installing tall chimneys in factories so that the smoke can be released at a higher altitude.
- Using gaseous fuel instead of coal, diesel and petrol
- Designing emission control systems.
- Using public transport.
- Using alternative energy sources like solar energy, hydro electric power and wind power.
- Avoiding burning of substances near civilian areas.

In the following pair of pictures identify the right and wrong ones keeping in view the concept of air pollution and write the reasons.



LESSON - 7

WATER

Water is very essential for the life of plants and animals. Crops cannot be grown without water. Water is a basic need for all. There are many uses of water. So water is a very important resource. It is called **life liquid**. 71% of the earth surface is covered by water.

After studying this lesson you,

- know about the sources of water.
- understand the physical characteristics of water.
- appreciate the biological importance of water.
- know the importance of conservation methods of water.
- verify the traditional and modern ways of water conservation.

Recall the distribution of water on the earth, that you have learnt in your previous class.

Answer the questions

1. Where can you find more water on the earth?

   _____

2. What is the consumable quantity of fresh water?

   _____

3. What are the sources of fresh water?

   _____

4. Write here the sources of water that you know.

   _____ _____

   _____ _____

   _____ _____

   _____ _____

Rain is the main source of water. Let us know about other sources.

Oceans : Oceans are the biggest source of water on the earth.

Look at this **Globe**. Blue colour indicates the portion of the earth covered by water.

Rivers : Rain is the source of river water also. Melted snow from mountains reaches the river during summer. So rivers overflow. All the rivers flow in their definite route and finally reach the ocean.

Name some important rivers of Karnataka.

_____ _____

_____ _____

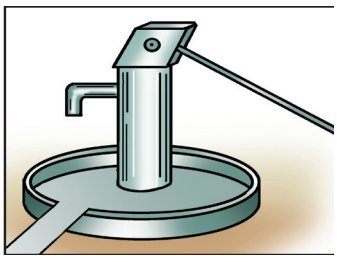
_____ _____

Springs

Water that is stored under the earth's crust and comes out due to the pressure through an opening is called **spring**. Rain water which enters the earth through its loose portions will be collected as underground water and this comes out in the form of a spring.

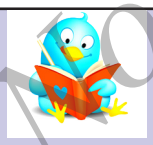
Wells

Underground water obtained by digging the earth's crust to a certain depth is called well water.

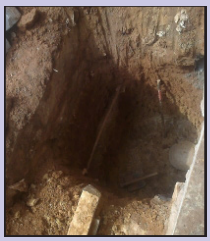


How many types of wells are there? Which are they? Write here.

_____ _____



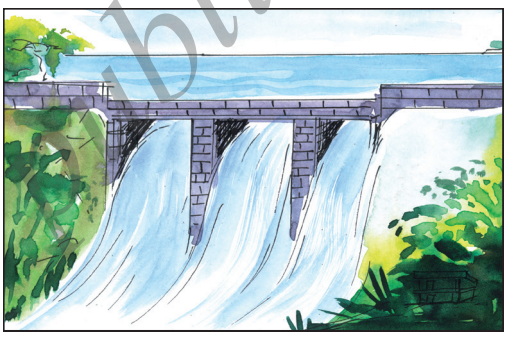
Know this : Due to the excessive utilization of underground water, it is getting exhausted. It can be regained by the absorption of rain water into the earth. Soak pits must be constructed for this purpose. We have to minimise the utilization of underground water and we have to follow some restoration methods like rain water harvesting, and recycling of water.



Ponds

An artificially man-made low level portion of land, to store water is called a pond. Its capacity of water storage is less. It is constructed in such a way that rain water which drains from high level will be stored here. Rain water reaches ponds by running through rivulets (small streams) also.

Reservoires



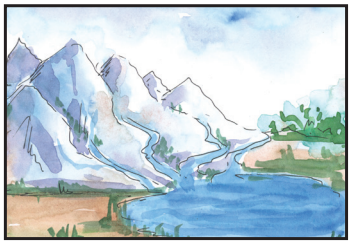
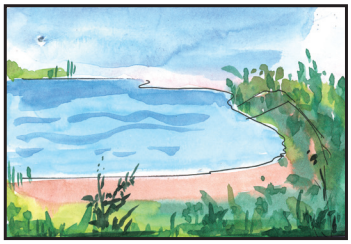
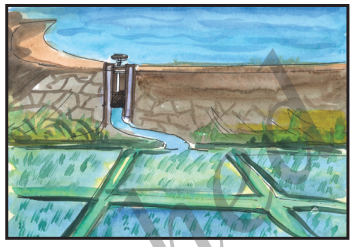
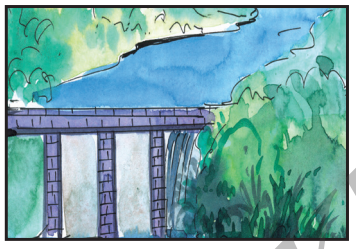
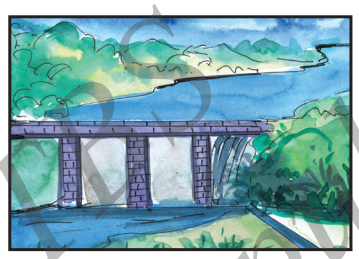
Dams are constructed across the rivers to store water through out the year and to supply water to places where there is scarcity and also for multi purpose projects.These are capable of storing water in large scale and they are called **reservoirs.**

Write the names of water reservoirs in Karnataka

1. _____ 2. _____

Collect the picture of a water reservoir and paste here

With the help of these pictures note down the differences of pond and reservoir in these boxes. Write their uses also. (Get the help of the teacher)


Differences

Pond	Reservoir
_____	_____
_____	_____
_____	_____
_____	_____

Uses

Pond	Reservoir
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Think : Our elders constructed tanks, ponds and open wells to conserve water. Now-a-days reservoirs are constructed to conserve water. Which one is eco friendly among these? Why?

Collect the information about tank/pond/open well or reservoir which are near your locality by visiting with your teacher/an elder.

- In what kind of place is it constructed?
- How is water collected?
- What are its uses?
- In which season of the year will it be full? In which season will it be empty or less? Why?

From which source do you collect water in your house and at the school? Write here.

At home	At school

List out the uses of water.

At home	At school

Know this : In the list of uses that you wrote, have you considered the use for transportation? People also travel on water. Yacht/boats are used for shorter distances and also to catch fishes. Ships are used to travel longer distances.



Do this : Collect flowing rain water in a glass bottle. Collect rain drops directly in a bottle. Look at their colour. Write the difference that you find.

_____

_____

Take two glasses of water, add a spoon of sugar to one glass and a spoon of salt to another. Stir them and taste both. Write down what you have understood.

_____

_____

_____

Pure water is colourless, odourless and tasteless. Salts and minerals dissolved in water are responsible for its taste.

Do these activities with the help of teachers/parents. Then mark (✓) or (×) to the related statements. Correct the wrong statements and write.

Activity	Statement
• Lift an empty tumbler and a tumbler of the same size filled with water.	• Water has weight. ☐ _____
• Pour a cup of water on the stairs.	• Water does not flow from heigher level towards lower level. ☐ _____ _____
• Boil water in a small vessel.	• Water evaporates when it boils. ☐ _____ _____
• Put some specific quantity of water in a glass tumbler, a glass bottle, a glass vessel.	• Water does not take the shape of the container. ☐ _____ _____

You have learnt some physical characteristics of water. Water is a liquid substance. You will learn more about it in the lesson **Nature of matter.** Let us learn the biological importance of water.

Organisms have enormous quantity of water in their body. Plants and animals have 70% of water in their body. Origin of very early life took place in water. Water is essential for biological activities of plants and animals. Water is required for the growth of plants. Green plants need water for the production of their food.

Think : What happens if required quantity of water is not supplied to plants?

Our elders treated this precious water as an integral part of their life. They reserved a prominent place for water in their family rituals. Have you observed this at your home or in your neighbourhood?

- Which are the practices of worshipping water that you have seen in your home or in your neighbourhood? When are they celebrated? Write here.

- How do water sources get polluted?

Water pollution

Water is physically polluted by mud, garbage, paper, food residuals etc., Water mixed with industrial chemicals, chemical fertilizers and insectisides which have dangerous components turns the water poisionous. Drinking this water may cause diseases like cholera, diarrhea, dysentery etc., Sometimes it may even lead to death. Contaminated water extinguishes the aquatic life also.

Know this

- You know about the disease cholera, caused by contaminated water. Mosquitoes breed on stagnant water. Mosquitoes spread malaria disease.
- The parasite, Plasmodium is present in the body of the female mosquito called anaphylus. This parasite enters the human blood when a mosquito bites and leads to symptoms of fever, shivering, vomiting and head ache. This is called malaria. If proper treatment is not given, it may causes death.

We should not drink contaminated water. Health can be maintained properly by drinking potable water. Prepare and exhibit a chart in your class by discussing with your friends about what you will do to get pure/potable water?

LESSON - 8

AGRICULTURE

Read the famous poem (in Kannada) written by Rastrakavi Kuvempu. In this poem, words like Uluva yogi (the person who ploughs), annava dudivane thyagi (the person who sacrifices himself and produces food) have been used. Can you guess who he is? Write your answer in the box given below.

This poem is composed on farmers who provide food for us. Agriculture is the main occupation of the farmers. So farmers are also called agriculturists. Agriculturists engage themselves in agriculture and related activities to lead their life.

Come, let us know certain informations about agriculture and agriculturists.

After studying this lesson you,

- understand the various stages of agriculture and from where we get food.
- understand the nature of work and the problems of farm labourers, small scale farmers and large scale farmers and give solutions.
- understand organic farming and chemical farming and differentiate it.
- know about rain fed agricultural land and irrigated agricultural land.
- understand drip irrigation and spray irrigation and make a list of crops grown in both methods.
- collect information about intensive farming, mixed farming and horticulture.
- recognize the modern and traditional methods/systems of seed storage.

Remember : Observe the people who are working in the farms and fields. Remember the work they do there. Make a list of them.

1. _____

2. _____

3. _____

4. _____

5. _____

Crops growing in the districts of Karnataka have been given here. Observe.

Sl. No	District	Important crops
1.	Bidar	redgram, wheat, jowar, sugarcane
2.	Kalaburagi	redgram, wheat, jowar, pearl millet, bengalgram, cotton.
3.	Vijayapura	redgram, wheat, jowar, pearl millet, bengalgram, sugarcane, grapes
4.	Yadagiri	jowar, pearl millet, redgram, wheat, paddy, sugarcane
5.	Belagavi	sugarcane, jowar, wheat, bengalgram, groundnut, cotton, tobacco,
6.	Bagalakote	sugarcane, wheat, jowar, pearl millet, bengalgram
7.	Raichur	paddy, cotton, jowar, pearl millet, bengalgram, soyabean
8.	Uttara Kannada	paddy, coconut, areca, cardamom, pepper, cashewnut
9.	Dharwad	cotton, jowar, wheat, paddy, sugarcane
10.	Gadag	jowar, wheat, groundnut, cotton, sugarcane
11.	Koppal	paddy, cotton, pearl millet, redgram, sugarcane, greengram
12.	Haveri	cotton, sugarcane, millets, jowar, sunflower
13.	Ballari	jowar, cotton, paddy, redgram, sunflower
14.	Shivamogga	areca, ragi, coconut, paddy, sugarcane,
15.	Davangere	cotton, paddy, maize, ragi, sugarcane

16.	Udupi	paddy, coconut, areca, wheat, pepper, cashewnut
17.	Chikkamagaluru	ragi, coffee, paddy, cumin, tea, pepper,
18.	Chithradurga	groundnut, maize, cumin, bengalgram,
19	Dakshina Kannada	paddy, coconut, areca, pepper, cashewnut, cocoa
20	Hassan	paddy, horsegram, ragi, tobacco, coffee, sugarcane,
21	Tumakuru	ragi, groundnut, coconut, greengram, banana, redgram
22	Chikkballapura	horsegram, ragi, mulberry
23	Kodagu	coffee, orange, rubber, pepper, ragi, paddy
24	Mysuru	paddy, ragi, bengalgram, tobacco, sugarcane, groundnut
25	Mandya	paddy, ragi, sugarcane, horsegram
26	Ramanagara	ragi, mulberry, horsegram, cowbeans, mango
27	Bengaluru rural	ragi, cowbeans, coconut, grapes
28	Bengaluru urban	ragi, horsegram
29	Kolara	ragi, horsegram, mulberry
30	Chamarajanagara	ragi, jowar, mulberry, cowbeans sugarcane

Make a list of the main crops of your district.

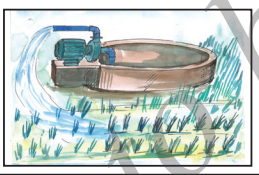
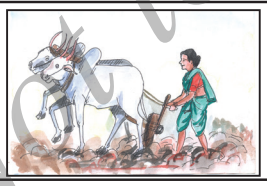
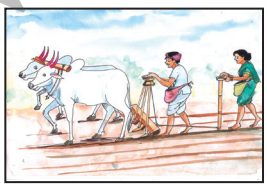
_____ _____

_____ _____

_____ _____

You have listed out the main crops of your district. Haven't you? Some common steps are followed to grow crops.

Look at the pictures given below. Read the statements given in front of the pictures. The pictures and statements do not match with each other. Match the pictures with the correct statements by drawing a line.

	Protecting the crop from animals, birds,insects and diseases.
 	Ploughing the land to grow crops.
	Sowing the seeds to grow crops.
	using chemicals or organic fertilizers for proper growth of the crop.
	Harvesting the crop either manually or with the help of machines.
	Irrigation for the proper growth of crops.

You have matched the pictures with the correct statements haven't you?

These are the stages of growing crops. You have matched the pictures with the correct statements but they are not in the proper order. Write them in the correct order in the space given below.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Think : Plants grown on the agricultural field are called crops. Why?

You know that farmers involve themselves in agriculture related works. The farmers working in the fields are of three categories.

1. Farm labourers

2. Small scale farmers

3. Large scale farmers

Read the information given below. Try to understand the three categories of the farmers. You can take the help of your teacher/elders.

It is a village. All the people of the village are living with love, faith and peaceful co-existence.

Rangamma belongs to the same village. She doesn't have agricultural land of her own. It is her responsibility to manage her family. So she does weeding, planting and separating cotton from the plant in other farms. Julakamma of the same village is a close friend of Rangamma.

Julakamma is a farmer. She owns a piece of land. She runs her family by selling crops grown on her farm. Both these women like Manjamma very much.

Manjamma is a successful lady agriculturist. She owns about 10-15 acres of land in the village. Many women of the village like Rangamma, work in her agricultural land. Manjamma not only grows crops but also she rears fowl and cattle. She purchases modern agricultural equipments for cultivation purposes. She also earns money through apiculture (rearing honey bees) and sericulture (silkworm breeding). So people of the village call her a large scale farmer. She always encourages and gives suggestions to the villagers to practice agriculture like her.

You have read the information, haven't you? Now match characters in the information with the correct words.

Rangamma	Large scale farmer
Julakamma	Farm labourer
Manjamma	Small scale farmer

Farm Labourers

They do not have their own agricultural land. They work in some other person's field to earn their living.

Farm labourers have problems of their own. Here are some statements. Put (✓) mark to the statements that are related and (×) mark to that are not related to the problems of the farm labourers.

1. Farm labourers do not get work through out the year. ☐
2. They get very less wage. ☐
3. Farm labourers are very rich. ☐

Do this : Meet some farm labourers of your village. Write in the space given below, the problems they face.

1) _____

2) _____

Many rules have been implemented to solve the problems of the farm labourers.

Example : It is mandatary to give minimum wages to the labourers.

Think : Think about the solutions for the problems of the farm labourers.

Activity : With the help of your teacher make a list of solutions for the problems of farm labourers.

1) _____

2) _____

3) _____

Small scale farmers

Small scale farmers own a piece of land of their own. They sell the crop, they grow in their field and earn money to lead life. They also face a number of problems.

Example :

- Shortage of money to cultivate the land.
- As the land holding is little, their earning is not self-sufficient to lead the family.
- Many times they don't get water for the land because of poor irrigation facilities.
- They lack proper guidance to grow crops that suit soil fertility of their land or the seasons.

A number of steps have been taken to solve their problems

Example :

* Monetary aid through bank loans

* Irrigation facilities through canals.

Apart from these, many more solutions have been provided to these farmers. Make a list of them with the help of your teacher.

1) _____

2) _____

3) _____

Large scale farmers

Usually large scale farmers own more agricultural land. In addition to family members, many others help them in the agricultural practices.

Some statements related to large scale farmers are given here. Observe.

- They purchase and use modern agricultural equipments.
- They store the grains in barns (godowns) and sell it when they get a better price.
- They utilize the monetary facilities of the banks
- Their income is high as they grow different crops.

What are the facilities that large scale farmers get from the banks? Discuss and write in the space given below.

1) _____

2) _____

Think : There are many helpers in the field of large scale farmers. Why?

We know that the farmers do agriculture in their agricultural land. Agricultural land has been classified into two categories.

1) **Rain fed agricultural land** 2) **Irrigated agricultural land**

Farmers grow crops according to the category of the land they own.

1. Rain fed agricultural land

Agricultural land which falls under less rainfall areas is called **rain-fed agricultural land**. Crops which require less water and are suitable for that soil, are grown there.

Rain-fed cultivation is called **kuski** or **dry land** cultivation

Activity : Make a list of crops that are grown in rain fed areas.

2. Irrigated agricultural land

Water is an important wealth for farmers. Cultivation of crops is impossible without water. Rain is the main source of water. We don't get rain all the time. So water is stored in different sources and utilized to cultivate the land.

Observe the pictures given below

Apart from rain, water is supplied to the crops from ponds, canals, wells and bore wells. Cultivating the land using water from any of these sources is called **irrigated agriculture.**

Sugar cane, paddy, cotton, are grown depending upon the soil quality of the irrigated land. These crops are called **irrigated crops**.

Activity : Make a list of irrigated crops discussing with your friends.

Water is available for agricultural land from ponds, canals, wells and bore wells. They are called **sources of Irrigation.**

Farmers who have sources of water follow some typical/ distinct irrigation methods to avoid wastage of water.
They are -

1) **Drip irrigation**

2) **Spray (sprinkles) irrigation**

Look at the pictures, try to understand **drip irrigation** and **spray irrigation**.

In drip irrigation, water is supplied to the roots of the crops drop by drop. In spray irrigation, water is sprayed over the crops uniformly as in rainfall.

Activity : Make a list of drip irrigated crops and spray irrigated crops (take the help of teachers/elders).

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

What are the uses of drip irrigation and spray irrigation?
List out here.

1) _____

2) _____

3) _____

4) _____

5) _____

6) _____

Think : Farmers are advised to adopt drip irrigation in recent years. Why?

Know this : In certain agricultural lands, soil has deficient nutrients. So it is less fertile. It is called barren land. It is not easy to grow crops here. But recently plants such as Jathropa and pangamia (honge) which yield biofuel are being grown in barren land.

You have learnt about the types of agricultural land, haven't you? In recent years farmers follow two types of cultivation / farming to grow crops, whether it is rain-fed agricultural land or irrigated agricultural land.

They are

1) Organic farming

2) Chemical farming

To understand these methods, read the statements given below. With the help of your teacher identify the statements related to organic farming and chemical farming. Write them in the respective charts.

Statements

- Chemical fertilizers are used.
- Manure/organic-compost is used for agricultural land.
- Vermi-compost is used to increase the fertility of the soil.
- Pesticides are used to grow crops.
- Green leaves/dry leaves are also used in this method of cultivation.

Organic farming

Chemical farming

In chemical farming, chemical fertilizers and pesticides are used to grow crops. In organic farming manure, green leaves compost, vermi-compost and organic pesticides are used to grow crops.

Think : Organic farming is better than chemical farming. How?

In agriculture, many methods are being followed to grow crops. **For Example,** Some of the methods of cultivation are given here. Read and understand.

1. **Intensive farming :** Growing 2 to 3 crops on the same land in a year. **For Example**, jowar, paddy, ragi, sunflower, cotton, horsegram, bengalgram, redgram.

2. **Mixed farming :** In addition to cultivation of crops cattle rearing, poultry, sericulture and apiculture are also done.

Activity : Many agricultural activities and secondary occupations are also practised in mixed farming. With the help of your teacher make a list of secondary occupations.

_____ _____

_____ _____

3. **Plantation farming :** Fruits, vegetables, coffee, tea or flowers are grown instead of food crops on the agricultural lands.

Activity : Make a list of fruits, vegetables, flowers which can be grown in Plantation farming. Get the help of the elders.

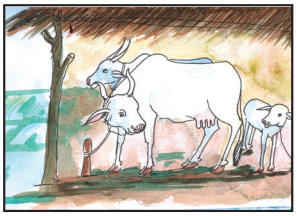
_____ _____

_____ _____

Thus, farmers adopt different agricultural methods and earn their income.

Do this : Go to an agricultural land with your friend. Observe the methods being followed there and name them.

Observe the pictures given below. Write the corresponding agricultural methods in the space given.

Figures	Agricultural methods
	_____
	_____
	_____
	_____
	_____
	_____

Storing and preserving the grains after the harvest of the crop is also very important. Observe these pictures. Some of the methods of storing and preserving the grains have been shown. Identify them with the help of your teacher.

In the first two pictures we can see the storage system used in olden days. They are called underground granary (Hagevu) and bamboo granary. These are traditional methods of storing grains.

Food grains/products are being grown on large scale. Granaries have been constructed to store and preserve food grains/products. Farmers can preserve their food grain in government granaries in little expense.

Think : Preserving grains is essential. Why? How is it useful for both the farmer and buyers. Write here.

1) _____

2) _____

Agriculture and farmers are like two wheels of a cart. Agriculture is the main occupation of our country. People who lead life following the profession of agriculture are the real food providers (Annadatas). **If the cultivator harvests, the whole world rejoices. If the cultivator fails to harvest, the whole world sobs.** These lines highlights the importance of the farmers

Let us salute the farmers, the food providers.

LESSON - 9

FOOD - ESSENCE OF LIFE

Hasiyade unabeda hasidu matthirabeda
bisigoodi thangalunabeda
vaidyanagasaneye beda Sarvajna.

Observe the tripadi of Kavi Sarvajna. In the second line he says not to eat stale food mixing with fresh food. Why does he say so? Think. Write your answer here.

_____

Yes, this line refers to the food which we eat. Food is the essence of our life. Everyday we do one or the other work. We need energy for doing work. We get energy from the food we eat. Food is necessary for our growth, development and good health. What is there in the food we eat? How should our food be? This unit contains some information about it. Read and understand.

After studying this lesson you,

- recall the nutrients of food.
- know about the sources of food and availability of food.
- recognize the diversity of food in different places by understanding the points that decide the food system.
- understand the changing food habits and its effects on health.
- understand the term food wastage and the methods to preserve it.

You already know that there are many nutrients in the food that we eat. The nutrients of food and the food materials which are rich in those nutrients are given below. Match the statements that suit the nutrients correctly.

Nutrients	Food materials
carbohydrates	fenugreek (menthya), carrot, sprouted seeds, fish oil, green-yellow vegetables
lipid	ragi, wheat, jowar, foxtail millets, little millets, bread, honey.
protein	groundnut, meat, fish, dry coconut, sesame, egg yolk.
vitamin	vegetables, fruits, lemon, cereals.
minerals	cucumber, watermelon, grapes, radish, ashgourd, brinjal, cabbage, cauliflower
water	cowbeans, redgram, black eyed beans, milk, greengram, soyabean

You have matched the nutrients and their suitable food materials. Haven't you? These nutrients are helpful for our growth, repair, body building and for being healthy.

Think : We can't maintain our health if we eat food containing the same nutrients everyday. Why?

Observe the following food materials.

Paddy, foxtail millets, meat, pearl millet, mango, cheese, ragi, ghee, egg, cauliflower, milk, fenugreek seeds, carrot, butter milk, radish.

Do this : Classify the food materials given above and write them in the table given below.

Food materials from plant source	Food materials from animal source

These materials are available for us from plant source and animal source.

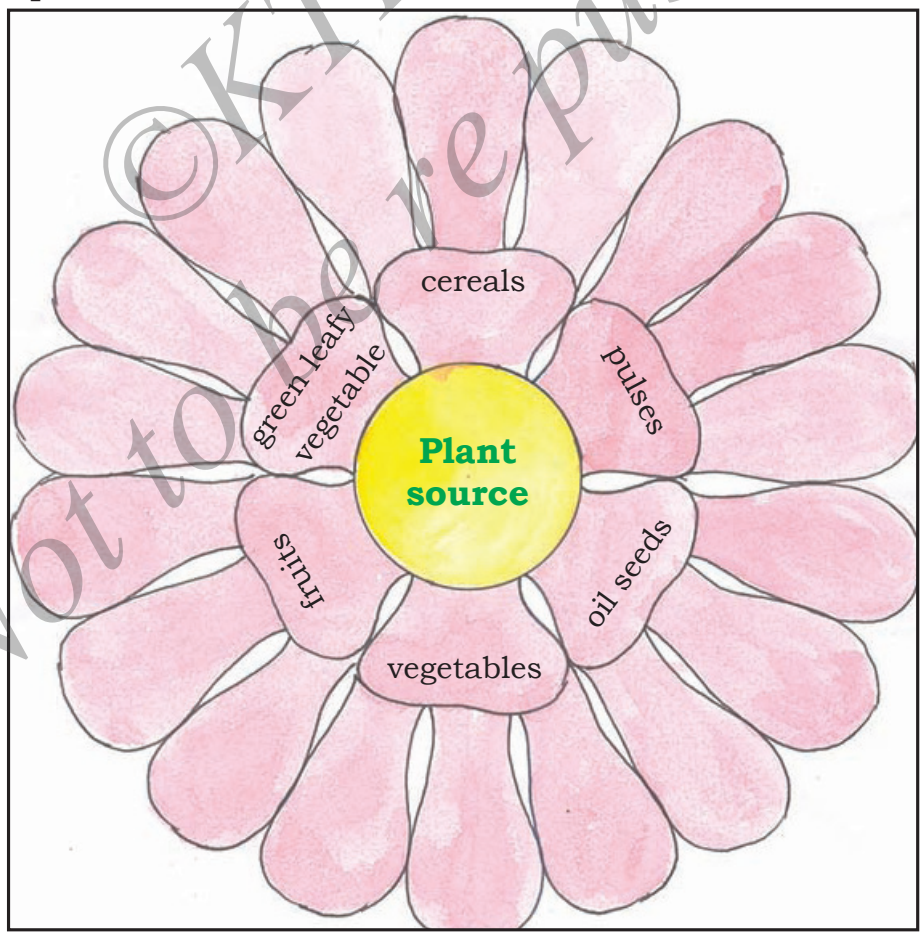
The food substances from plant source are classified as follows.

- cereals
- pulses
- oil seeds
- vegetables
- green leafy vegetables
- fruits

The list of some food materials obtained from plant source is given. Observe.

mango	brinjal	sesame	green gram	foxtail millets	amaranth (harive)
palak	groundnut	lemon	beetroot	fenugreek seeds (menthya)	sunflower seeds
sweet potato	redgram	jowar	black gram	orange	little millet

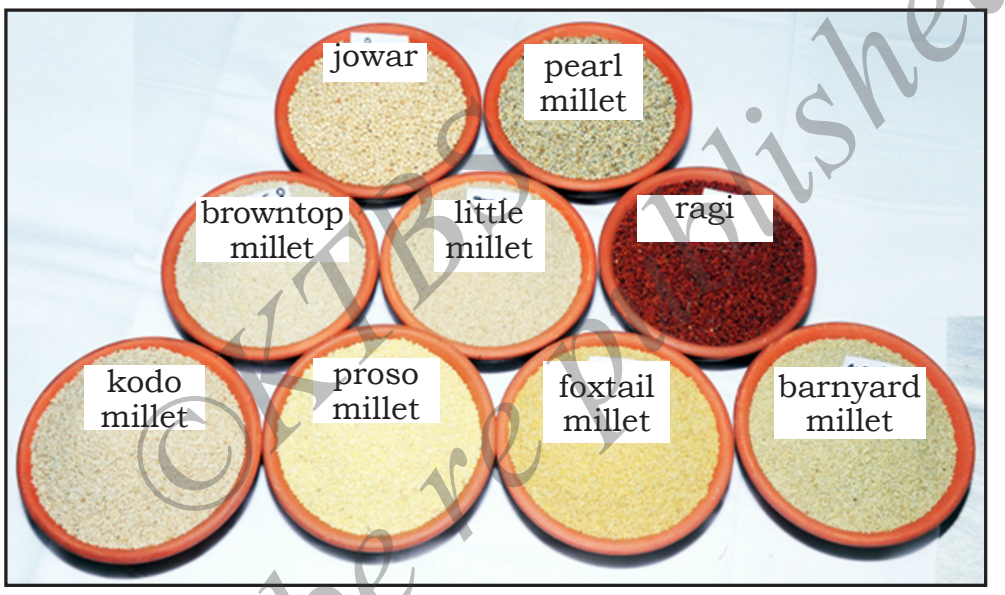
Write the food materials given above in the related petals of the plant source.



Millets

The food we eat consists of more than one nutrient. Among them, millets like foxtail millets, barnyard millets, kodo millets are the barn of nutrients. Our elders used to consume more of millets. Now-a-days the consumption of these cereals which are considered to be healthy, is reducing.

Important millets.



Activity : List out the millets shown in the picture

_____ _____ _____ _____ _____

_____ _____ _____ _____

Uses of millets :

- Millets can be grown using less water in less period of time.
- They grow easily in different environment and climatic condition.
- These can be grown without using chemical fertilizers, pesticides and herbicides..
- These are called the **friends of famine**.
- These cereals have a lot of nutrients.

Think: Now a days doctors advise patients to consume millets. Why?

Availability of food : The fertility of agricultural land and climatic conditions differ from one place to another in our state. So all types of crops cannot be grown in all the places. Crops like jowar, ragi and paddy cannot be grown in all places.

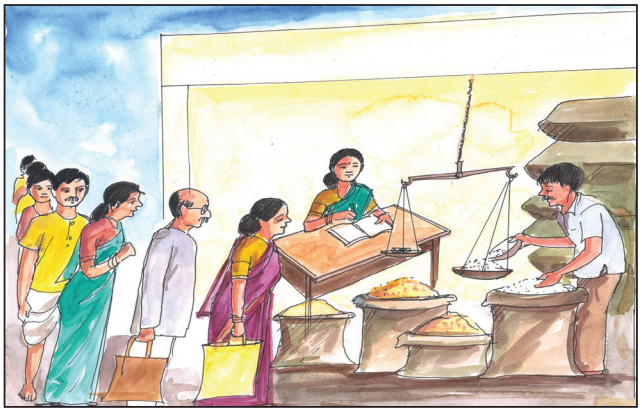
Think : Increasing population and decreasing agricultural land is the cause for decrease in the availability of food. How?

Therefore the Government has taken steps to ensure availability of food for all the people.

Example :

1. Giving milk and mid-day meals to students in school.

2. Supplying food materials at nominal rates through fair price shops.



3. Steps are taken to prevent unnecessary holding of food materials by the merchants.

4. Purchasing the food materials from the farmers, storing them in proper godowns and then distributing.

Think : What are the advantages of giving mid-day meals and milk in schools.

As food materials are available, it is possible to prepare food for us. Make a list of the food, prepared at your home.

1) _____

2) _____

3) _____

4) _____

Compare this list with that of your friends. Observe whether your and your friends' list of food differ.

Complete the following activity.

Your food

Season	**Food you eat**
Summer	
Rainy	
Winter	

Neighbour's food

Neighbouring house	
The common food of your village or town	
The common food of your district	

The common food of different places of Karnataka
(Get the help of the teacher)

North Karnataka	
South Karnataka	
Coastal Karnataka	
Malnad	

Answer the following questions
(use the chart shown above)

- Which food do you take mainly in summer?
- Which food do you take commonly in winter?
- Which is the main food of your district?
- The food of different places in Karnataka are different. Why?

1) _____

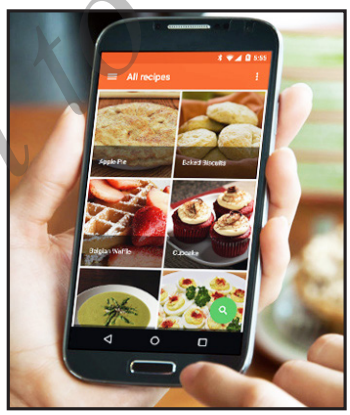
2) _____

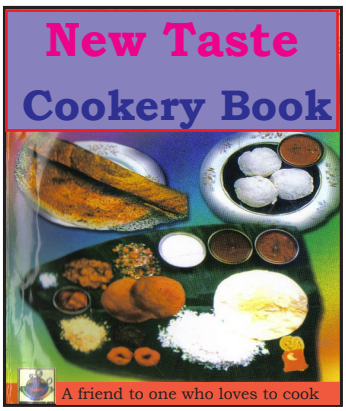
3) _____

You have answered the questions. Haven't you? Some statements about the factors which decide the food we take are given. Observe.

- Although we are of the same state, our food system is on the basis of the climate and the food materials which are available/grown in the region in which we live.
- The food which we eat is decided by the tradition/beliefs of a particular family.
- Our food changes according to the seasons like summer, rainy and winter.

Although all these aspects influence our food, now a days our food habits are becoming similar. Observe the following pictures.





The above factors are responsible for the change in our food habits.

They can be described as follows

- Magazines, advertisement.
- Cooking related programmes telecasted in TV channels and radio.
- The new food habits have become common, due to the use of internet in mobile phones and computers.
- Cookery books

  Due to the influence of factors mentioned above, our food habits have changed as follows.
- Consumption of food items like pizza, burger, sauce, samosa, corn-flakes, soup, noodles, ice cream, chocolate, chips have increased, instead of consuming nutritious home made food. Some of them are considered junk food.

Know this : Junk food means the food material which has less nutritional value or is unnecessary from the health point of view.

Think : Junk food is not good for health. Why?

- Consuming sauce rich food items like gobi manchurian, pani puri,chinese food has become common. The sauce contains certain chemicals which make food tastier.
- Consuming the outside food instead of home made food is on the increase today.
- Use of readymade food is increasing in the mechanical life of city/town.
- Eating fast food, is an example for this.

Think : What is fast food?

The effects of change in food habits:

- People fall sick easily.
- Poisonous chemicals enter the body due to the intake of tasty food instead of healthy food.

- Body is losing the power to fight diseases.
- Consumption of spicy food and junk food has given rise to obesity problems.

Activity : Which type of food should we eat? Discuss with your friends about this.

Ready made food packets

Now-a-days, food we eat is now available in packets. While buying them observe the following points.

- Date of manufacture and expiry date.
- The ingredients added to the stuffs/ quantity of chemicals.
- Temperature needed to preserve the packet.

Activity : Take a packet of food stuff and list out the points mentioned above.

Think : It is dangerous to eat food stuffs which have expired or consist of a lot of added chemicals.

Wasting of food

We can see food being wasted here and there in these pictures. Throwing away food which is worth consuming is called **wasting of food**.

Activity : Food is being wasted in many circumstances. With the help of your teacher, list out the situations and the reasons for which food is being wasted.

It is important to preserve our food or food stuffs without wasting and spoiling them.

Now a days food stuffs are preserved by following some methods. They are-

- We know the taste of pickles. Salt is added to it in order to avoid spoiling for many days. Chemicals like sugar are used to preserve the fresh fruits.

- Grapes are dried and used as drygrapes.

Activity : List out the food stuff which are preserved by drying them.

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- Fish, meat and milk are preserved by storing them at very low temperature. It is called **cold storage**.

For example, Refrigerator (fridge).

Good food keeps us healthy-physically and mentally. Food is the essence of our life. To be healthy, it is important to protect ourselves by eating good food.

LESSON - 10

RESIDENCES

You might have heard that **home is the first school and mother is the first teacher.** Home is a familiar term for us. Early man protected himself against sun light, rain, wind and wild animals by living in caves and bushes. Hence they are called the early shelters of mankind. Home became a need as man became civilized. Construction of houses were started by the civilized man as the need for a home increased in accordance with the changes in society. Construction of residences started from independent houses and got transformed to community houses.

After studying this lesson you,

- know about personal and community housing projects.
- understand the problems related to rural and urban residences.

Look at the pictures given below. You have learnt about the construction of these houses in the previous class. Write the materials required to build the houses given in the picture in the space provided.

Type of house	Building materials required
	_____ _____ _____

	_____ _____ _____
	_____ _____ _____

People live in various types of houses such as hut, house with tiled roof and houses with concrete terrace. Many families in villages or towns are living in houses constructed side by side in a locality. These are called **residences.**

Do this : Observe the lanes of your village or town. These are the areas of common residences. Generally families lead their life by constructing their own personal houses. The common features found in residences are given below. Write down the other features that you have observed.

- Houses built here and there or houses in a lane.
- Lanes are mostly zig zag.
- Street lights are there in the residential areas.
- _____
- _____
- _____

Facilities are rarely available in areas where people build their own houses. Now-a-days community housing projects have started to meet the needs and demands of the people due to over population. Following pictures are the examples of community housing.



Community houses are constructed for various advantages. Some statements are given below. But some of them are not the correct reasons. Put (✓) mark only for correct reasons.

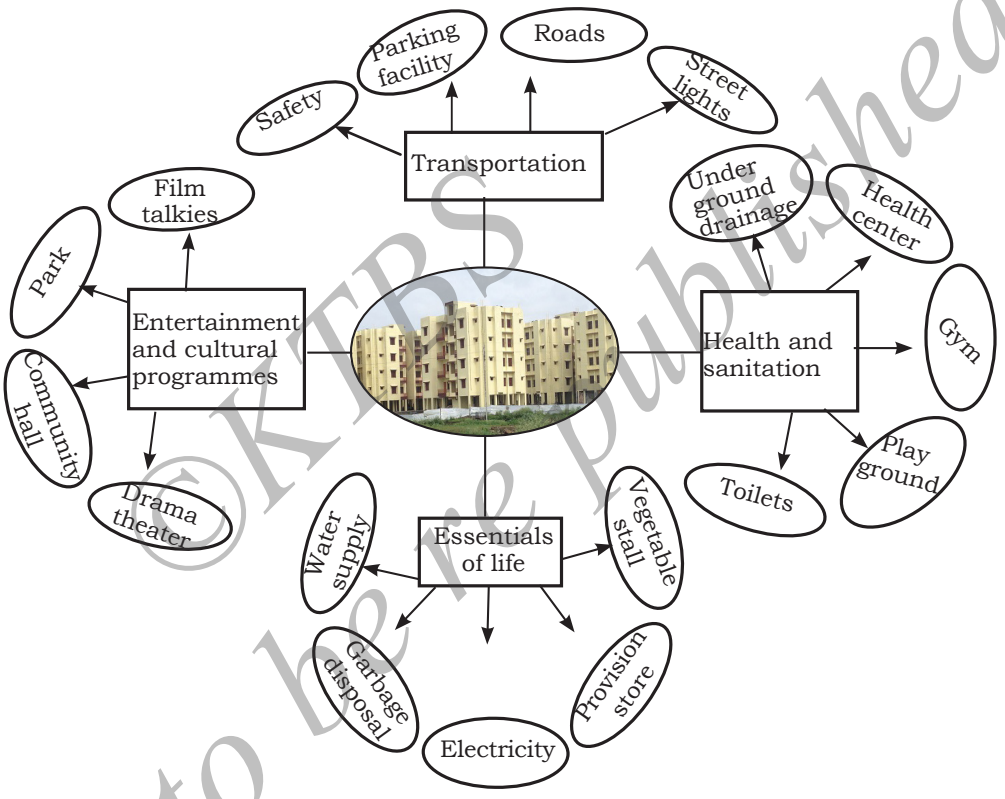
- Many families live together in community houses. ☐
- The Government provides housing facilities for the poor families by constructing community houses in villages and cities. ☐
- They are constructed to provide systematic basic facilities for a large population in limited space. ☐
- Houses in multistoreyed buildings are constructed and are suitable for the residence of a single family. ☐

Objectives of community houses are –

- To provide all the facilities to the houses which are required by families.
- Providing good roads, transportation facilities, electrification, water supply and garbage disposals in a planned way.
- Constructing parks, hospitals, etc., for public needs.
- Connecting community houses to the regional main roads.

Do this : Make groups of four students each. List out the facilities available in community houses. Take the help of your teacher.

The facilities available in community houses are given in this chart. Observe.



Activity : Is it possible to provide facilities available in community houses to the independent houses? Discuss with your friends.

Usually community housing projects are implemented in suitable places in villages and cities. The Government build community houses in villages. The Government has formed separate housing boards for the construction of houses in cities. Many problems arise during construction of houses in villages or cities.

The above pictures reveal some problems of residential areas

Observe the following statements. Some residential problems of rural/urban areas are given. Write the rest after discussing with your friends (Take the help of your teacher)

Housing problems in urban areas.

* No underground drainage system.
* Garbage disposal problems.
* Frequent fire accidents in multistoreyed buildings.
* _____
* _____

Housing problems in rural areas

* No bathroom and toilet facility.
* No proper electrification.
* Lack of pure drinking water supply.
* Roads not suitable for the transportation of vehicles.
* No underground drainage facilities.
* _____
* _____

Look at the list of urban and rural housing problems. The facilities that the best city residence/village residence must have are given here. Observe.

Housing features of the best city or village

* Proper ventilation and light.
* Rain water harvesting system from the roof of each house and its storage.
* Electricity by solar energy.
* Closed underground drainage system.
* Proper system for garbage disposal and preparation of manure from garbage.

A good house can provide health, happiness, and peace for the family members and their neighbours.

Houses with the best facilities lead to good health.

LESSON - 11

NATURE OF MATTER

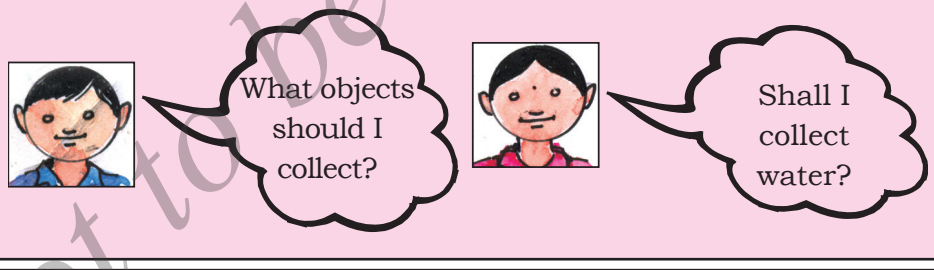
We see several materials (objects) in our daily life and use a few of them. These materials are also called matter. These materials are not just like one another. But if you observe keenly, the characteristics of some materials appear similar. Every one is eager to know, what are the constituents of these materials? What are the common characteristics of these materials?

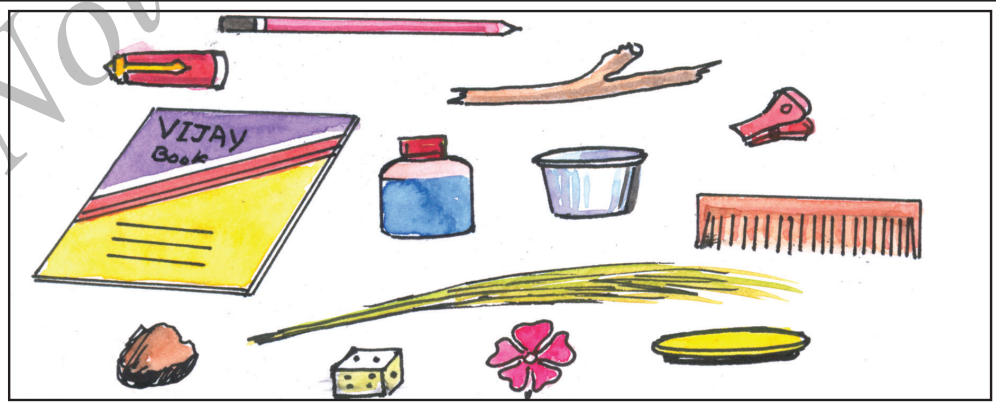
After studying this lesson you,

- understand about matter.
- explain the characteristics of matter
- identify different states of matter
- understand the types of change in states of matter.
- understand about mass, density, pressure, sublimation and buoyancy.

In our daily life, we see objects in different forms.

Activity : Collect at least ten objects in your surroundings.





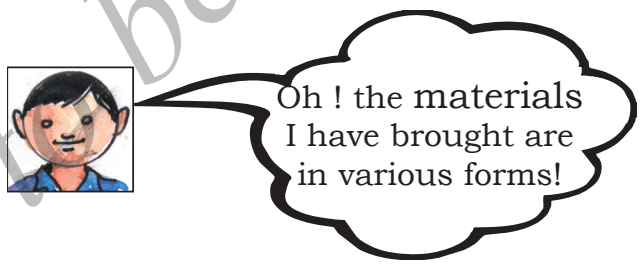
Activity : List out the names of the materials you have collected by arranging them neatly.

_____ _____ _____ _____ _____

_____ _____ _____ _____ _____

Observe whether the objects you have collected are as follows. If yes, put (✓) mark and if no, put (×) mark.

• Have you brought hard material?	
• Is there any soft material?	
• Is there any material which could be stored in a bottle or a bowl?	
• Is there any brittle material?	
• Is there any material which can be dissolved in water?	
• Is there any material which turns into manure after mixing with the soil?	



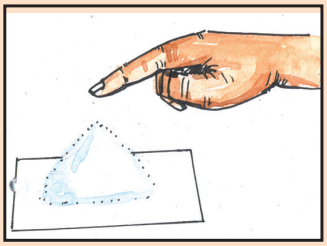
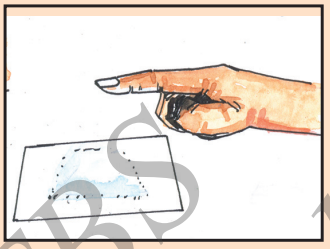
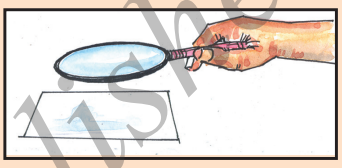
Activity : Observe the differences if any, by comparing the materials collected by you and your friend.

From the above activity you can understand that materials are in different forms in their shape, colour, brightness, solubility, etc., Isn't it?

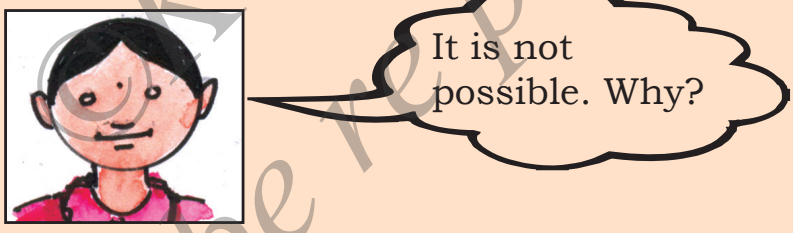
Matter (object)

How are the materials available in nature created?

Experiment : Take some chalk powder. Dip your finger in it and sprinkle slowly over a plane glass. Observe these minute pieces carefully through a convex lens.

Can these minute pieces be divided further? Think and try.



Is it not possible for us to divide them further?

We can observe that the finest pieces of chalk cannot be divided further, though we try to do so.

Scientifically materials are called matter. Matter is made up of small particles. The smallest piece of matter is called **particle**.

Think : Read the instances given below and try to remember if you have experienced any.

- How did fragrant particles reach your nose from the opened scent bottle?
- How did your nose feel that the neighbouring room is being swept?
- Did you notice any collection of dark particles when fire wood is burnt or kerosene lamp is lit?

Particles present in the matter are invisible. Matter is made up of very minute particles. Hence visible matter consists of invisible particles.

- What do you mean by matter?

_____

_____

Activity : Collect and paste the available pictures of matter in the following boxes.

Activity

- Take a material, make it into minute pieces. Write the name of the matter which you have divided into minute pieces.

- Collect the powder of available matter and exhibit it in your class room.

Properties of Matter

Matters have special properties. These properties can be understood with the help of some experiments and activities.

1. Matter occupies space.

Activity : Pour the wheat flour or any other flour into a bowl, from a box. Again try to fill the bowl, so that the flour does not spill.

- Was it possible?
- Did you completely fill the bowl?
- What should be done to pour some more flour into the bowl? Why?
- It was impossible to fill the bowl completely with the entire quantity of the flour present in the box Why?

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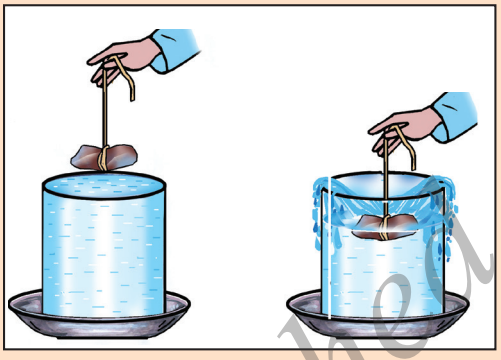
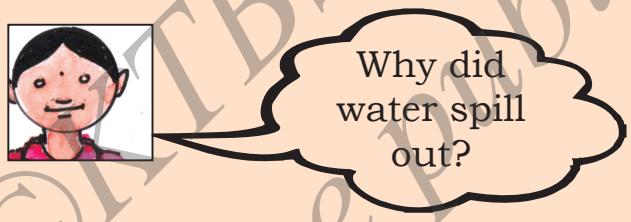
Experiment : Put a glass beaker completely filled with water on a plate. Slowly immerse a stone of appropriate size tied with a thread into the beaker as shown in the picture.



- What happened when the stone is immersed in the beaker?

_____



- Why it is so? Think and explain to your friends.

Matter occupies space. A matter cannot occupy the place of another at a same time.

- Write the names of some matter arround you.

_____ _____

_____ _____

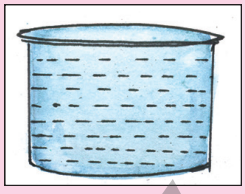
_____ _____

_____ _____

Air is a matter. Air occupies space in its container.

Activity : Blow air into a balloon. Particles in the air are rarely distributed. So particles of one matter can be accommodated in another in which particles are rarely distributed.

Activity : Add some sugar or salt into a beaker fully filled with water, without allowing water to spillout.



- How is it possible? Discuss with your teacher.

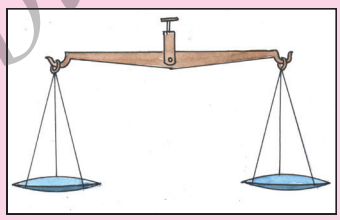
Think : What happens to the tube of a vehicle when it is filled with excess air? Why?

Matter is made up of various visible and invisible particles.

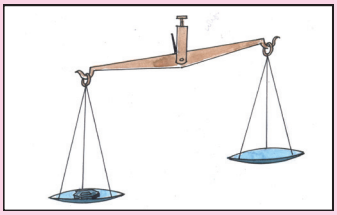
2. Matter has mass.

Activity :

- Take a weighing balance and note down the position of its needle. Write here.



- Put any material of 50 g in one pan and note down the position of the needle. Write here.



Weigh different materials you have or those which are available in your classroom with your friends.

Think

- Is there any matter without weight?
- Place a matter in a pan of the balance. Observe.
- Is it possible to keep both the pans equal? Try. If not, why?

Activity : Try to lift a bag with 3kg rice and another same type of empty bag. Write your experience here.

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Matter is a total sum of many particles. It has mass. Matter is made up of small particles. Total number of particles in a matter depends upon its weight. The material which occupies space and posseses mass is called **Matter**.

Activity : What are the properties of matter? Write here.

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States of matter

Depending upon the arrangement of the particles in a matter, different states of matter are recognized.

Activity : Fill up the following table using the clues.

Required, To burn :	F			E	W			D
To drink :				W				R
To breath :							I	

Fill up the names of the matter filled above in the following table.

Solid Hard material	**Liquid** which gets the shape of the container	**Gas** which cannot be held/ is invisible/spreads/ can be experienced.

Activity **: List out the materials that you know which are in the form of solid, liquid and gas.**

Solid : _____ _____ _____ _____ _____

Liquid : _____ _____ _____ _____ _____

Gas : _____ _____ _____ _____ _____

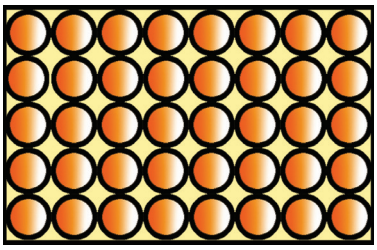
Think and group these materials in their particular column; buttermilk, candle, curd, kerosene, charcoal, honey, piece of brick, smoke.

Solid	Liquid	Gas
_____	_____	_____
_____	_____	_____
_____	_____	_____

Matter is identified in its three forms - Solid, Liquid and Gas.

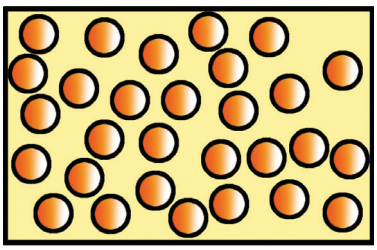
- In solids, particles are densely and orderly arranged.

  Example : stone, iron etc.,



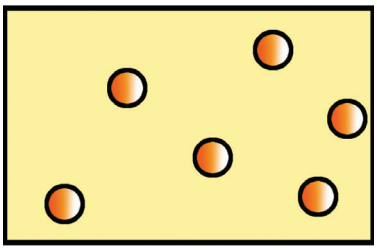
- In liquids, the particles are loosely arranged when compared to solids.

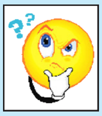
  Example : water, milk etc.,



- In gases, the particles are rarely arranged.

  Example : air, smoke etc.,

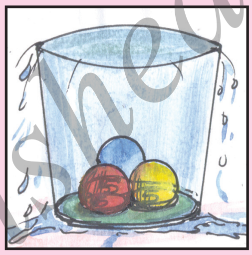




Think : Where have you found the presence of gas?

***Activity* :** Let us conduct an experiment to know that the particles are loosely distributed in a liquid.

- Take a beaker completely filled to the brim with water. Drop three marbles into it. Now water spills out. Why? Think and write here.



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- Take another beaker of the same size completely filled with water. Add some sugar powder of equal to weight of the three marbles. Did you find any difference in the water level? Observe and Write here.

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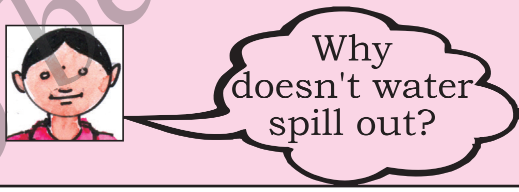


Since sugar particles have combined with the water particles, water does not spill out.

***Activity* :** Place a marble on a table, plate, beaker and so on. Did you find any difference in the shape and size of it?

Shape and size of the solids in any place do not change.

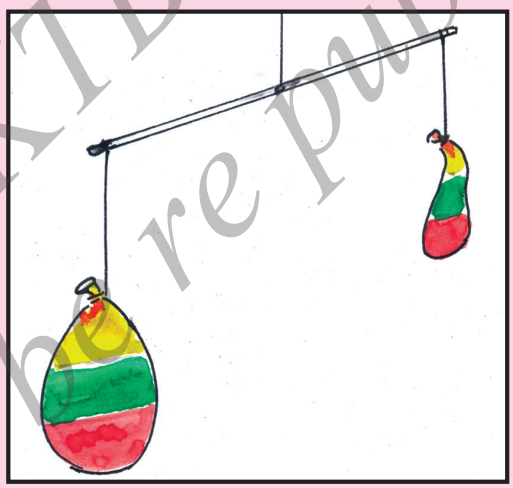
Activity : Pour water into a beaker, plate, polythene bag, etc., Do you find any difference in its shape?

Liquid takes the shape of its container. But does not change in size.

Activity : Light an incense stick and allow its smoke to spread inside a jar. What is the shape of the smoke now?

Gases spread over the entire space of the container and its volume changes.

Activity : Let us conduct an activity to know that the air has weight.



Take a stick of 50cm length. Tie an air filled balloon to one of its end and an empty balloon to the other end. Tie a thread at the exact center of the stick as shown in the picture and hold it freely.

What do you observe? Write here

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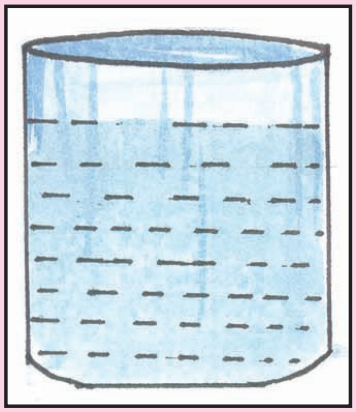
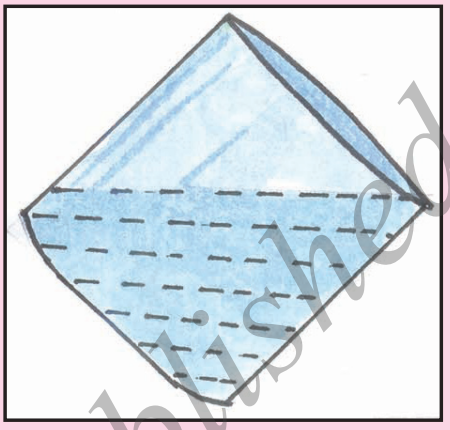
Activity : Observe the picture given below. Do this activity with the help of your teacher.

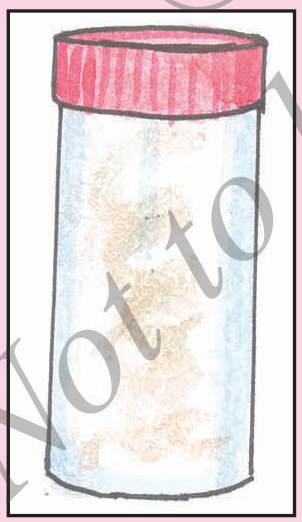


Place a glass beaker filled with water on plane surface and observe.



Place a glass beaker filled with water in a slant position and observe.

Shape of the liquid changes according to the space available in the container.



Smoke filled jar placed upright.

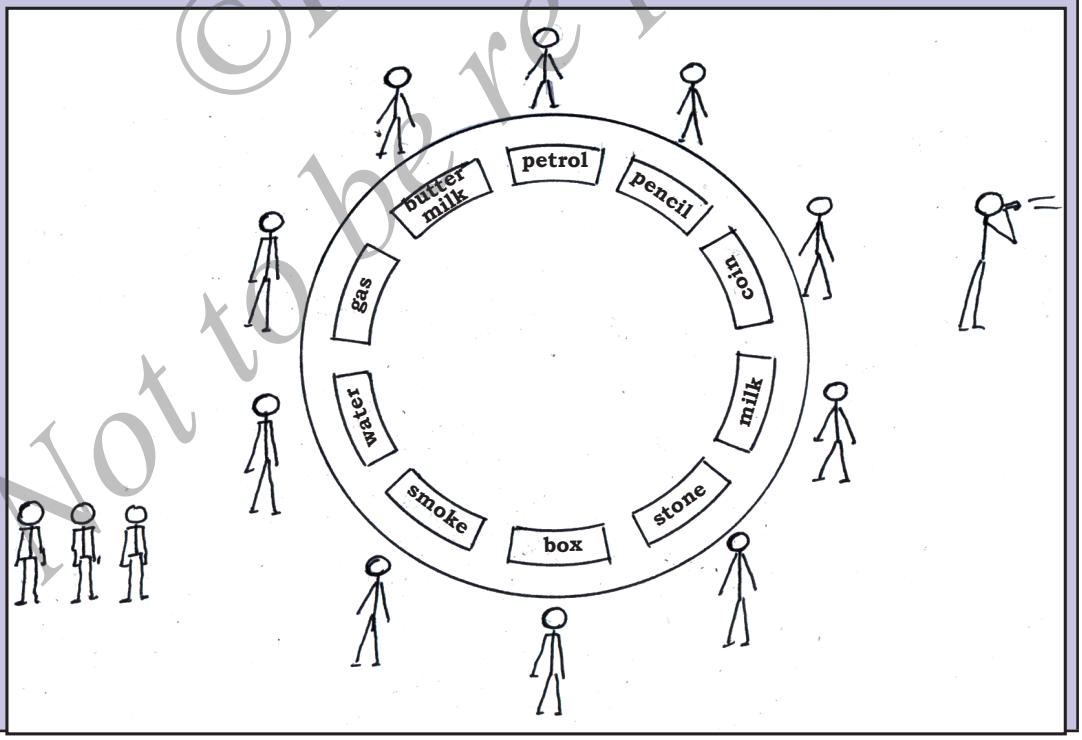
Smoke filled jar kept slant.

Gas occupies the shape of the container.

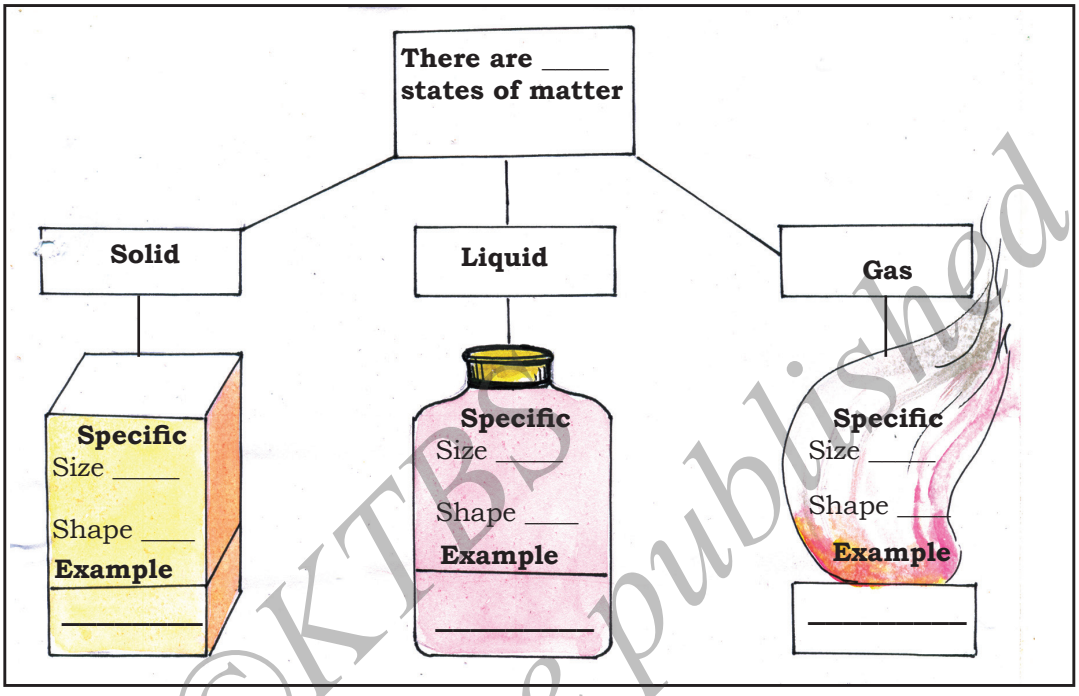
Come, let us play

Before you play, write some names of solids, liquids and gases on plain cards.

You and your classmates stand around a circle. Now put the cards inside the circle, and run around the circle. Ask one of your friends to stand outside the circle and stop you by blowing the whistle. When he blows the whistle all of you should stand near the cards inside the circle. Your friend who blew the whistle should call out any one among solid, liquid and gas. If he says solid, the players who stand near the cards of solids will be **out**. Like this continue the game. Ask the last one to give examples for solid, liquid and gas (one for each) and congratulate him/her.



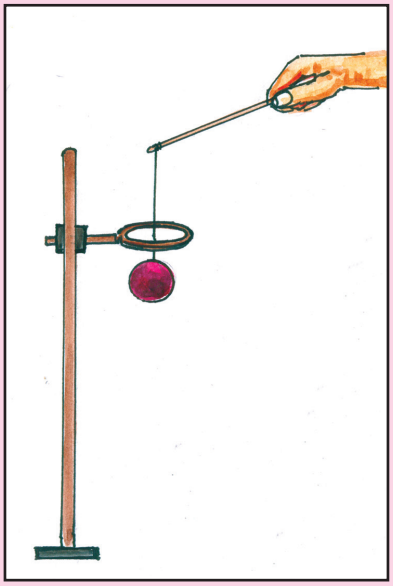
Fill in the blanks with suitable words :



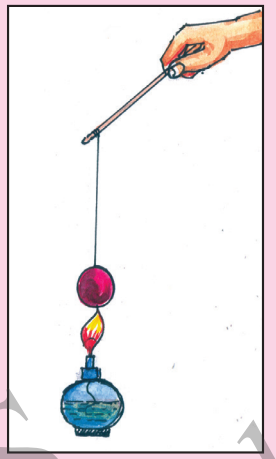
Effect of heat on matter

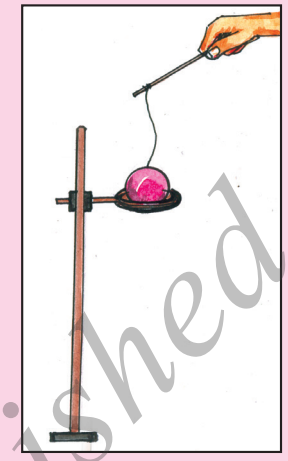
Activity : As shown in the picture, fix a metallic ring to a stand so that a bob can just pass through it. Take a pendulum of an iron bob and try to pass it through the ring.
(Take the help of your teacher)

- Did the bob pass through the ring?

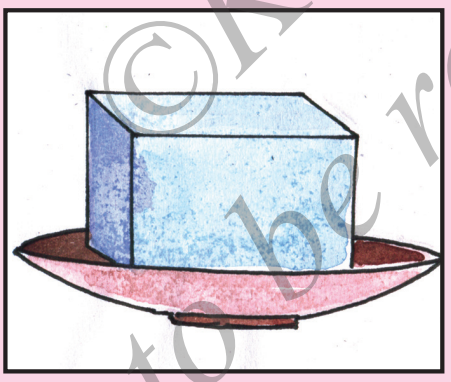


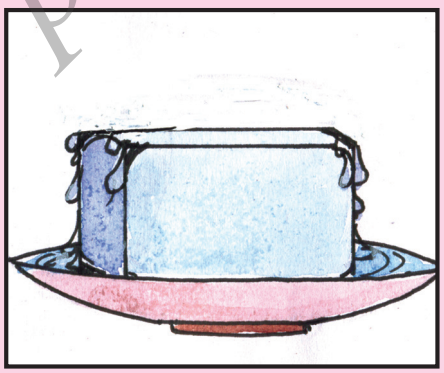
- Now heat the iron bob, and pass it through the ring. Did it pass through? Why?





Activity : Place an ice cube on a plate for 10 minutes.





What did you notice? Is there any change in the ice cube? Write here.

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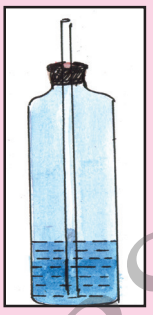
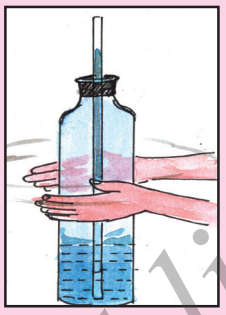
Activity : Take a small glass bottle filled with coloured water upto half of its volume, and close it with a single holed cork, as shown in the picture. Insert a thin transparent tube inside the bottle.





- Now roll the glass bottle between your palms as shown in the picture. Observe the water level in the tube, and write here.

_____

_____

- What is the change that has taken place inside the bottle due to rubbing by palms? Why?

_____

_____

From the above activity, we understood that matter gets changed when heated. Matter expands on heating. Hence solids, liquids and gases expand on heating.

Write what happens when the following objects are heated.

candle	
rice in a cooker	
water	

Change in state of a matter.

When an object is heated, there will be a rise in its hotness. The state of matter changes due to heat.

- Write the states of matter in the following situations.

1. Ice cube on heating _____
2. Water on heating _____
3. Vapour on cooling _____
4. Water on cooling_____

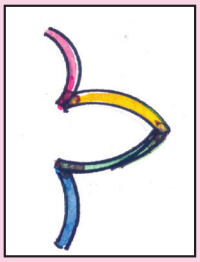
Matter changes its state from one form to another, due to heat. This is called as **change in state of a substance**.

On heating, many solids change into liquid state. Effect of heat on a matter depends upon the level of hotness. On increase in the heat, solid changes into liquid, and liquid changes into gas. In the same way on cooling gas changes into liquid and liquid changes into solid.

Solid $\xrightarrow{\text{heating}}$ liquid $\xrightarrow{\text{heating}}$ gas $\xrightarrow{\text{cooling}}$ liquid $\xrightarrow{\text{cooling}}$ solid

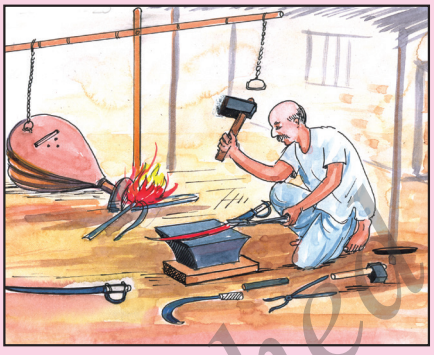
Example : Ice cube (solid) $\underset{\text{cooling}}{\overset{\text{heating}}{\rightleftharpoons}}$ water (liquid) $\underset{\text{cooling}}{\overset{\text{heating}}{\rightleftharpoons}}$ vapour (gas)

Activity : Take a broken piece of a glass bangle. By heating bend it into required shape and stick it on a cardboard.
(Take the help of your teacher/parents.)



You have learnt from the previous experiment that objects expand by heating.

Activity : Blacksmiths change some metals into required shapes by heating.



Why is iron heated?

Think and write here.

_____

_____

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Heat transmits from one object to another.

Example : ironing the clothes.

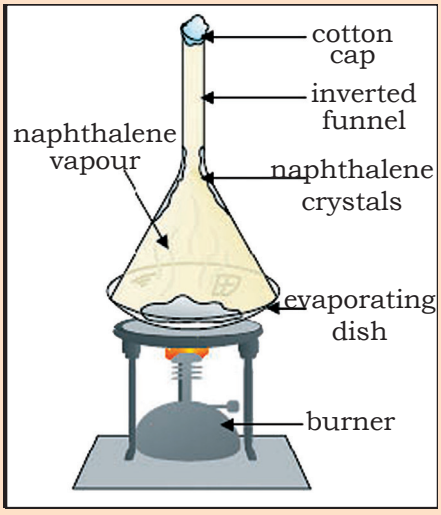
- Write an example for the changes in an object due to heat.

_____

_____

Sublimation:

Experiment : Take a few naphthalene balls in an evaporating dish. Close it with a glass funnel as shown in the picture. Take some cotton and close the other end of the funnel. Heat the dish slowly. Naphthalene converts into milky vapour and will be collected in the inner side of the funnel. Stop heating and observe what happens? Write here.



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We know that, when solids are heated they are converted first into liquid and then into vapour. Similarly, on cooling the vapours are converted first into liquids and then into solids. But some solids on heating directly convert into their vapour state and vice versa without passing through the liquid state and this is called **sublimation**.

Example : camphor, iodine,

Think : What happens to naphthalene balls kept in an almirah after a few days? Why?

Activity :

- Light a wax candle and observe what happens to the wax after sometime. Now putoff the candle and observe what happens to the melted wax and write here.

_____

_____

- Give examples for the following (Take the help of your teacher/parent.)

$$\text{Solid} \xrightarrow{\text{heating}} \text{Liquid} \xrightarrow{\text{cooling}} \text{Solid}$$

$$\text{Solid} \xrightarrow{\text{heating}} \text{Gas} \xrightarrow{\text{cooling}} \text{Solid}$$

Mass :

Activity : Measure the weight of different objects using physical balance in your school with your friends, and note down. The weight (see examples given)

rice	duster	groundnut			
5 kg					

Mass is the total quantity of matter cohering together to make an object or a substance. The mass is measured in terms of weight. The SI unit of mass is **kilogram (kg)**

Know this

- 1000 mg = 1 g
- 1000 g = 1 kg
- 100 kg = 1 quintal
- 1000 kg = 1 ton

Activity : Learn from the elders about the tools used to measure the quantity of objects in olden days and write here.

rice-pavu		

Density

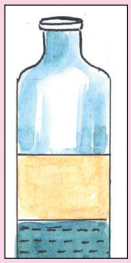
It is generally said that the cotton is light and iron is heavy. Why? Write here.

_____

_____

When two objects of same size are measured, one may weigh more and other may weigh less. Genarally we say that the density of less weighting objects will be less, and the density of more weighing objects will be more.

Activity : Pour a cup of water and a cup of oil into a glass jar. They won't mix together and will be seen seperately. Why?



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Think : Which one is heavier among 1 kg of cotton and 1 kg of iron?

Density is the amount of mass contained in a unit volume. Generally density of the solid is more than that of the liquid and the density of liquid is more than that of the gas.

The mass of an object (weight in **g**) in 1 cubic meter of its volume is called density. SI unit of density is kg/m^3. (kilogram per cubic meter)

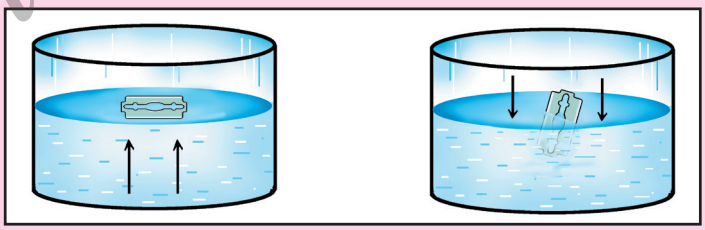
Activity : List the objects with less and higher density

Less Density	oil					
High Density	water					

Pressure :

Activity : Take a tumbler containing water. Place a blade horizontally. It floats. Place the same blade perpendicular to the surface of water. See what happens.

(Handle the blade carefully with the help of teachers/ parents)



_____

_____

Even though the mass of the blade is same, it floats in the former case, but sinks in the later case.

When the blade is placed horizontally, its mass is distributed over a wider area. Therefore mass per unit area is less and hence it floats.

When the blade is kept perpendicular to the water surface, it sinks since the mass is distributed over a smaller area. Therefore the consequence depends upon mass per unit area. This is called **pressure.** Pressure is the force exerted on a unit area.

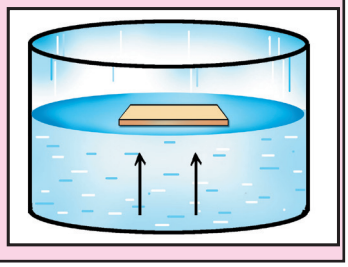
Activity : Immerse a stone gently into a glass beaker containing water.

- Write here what you have noticed.

_____

_____

Immerse a wooden plank into the other beaker containing water.



- Write here what you have noticed.

_____

_____

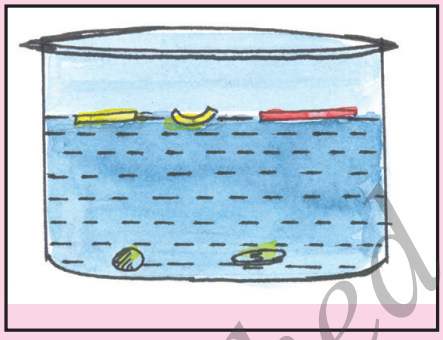
When an object is immersed in water, it exerts a downward force on water and the water in turn exerts an upward force or upward thrust on the objects. If the upward force exerted on the object is more than the downward force, then the objects float. This upward force exerted is called **buoyancy**.

Write names of any four objects which float on water.

1. _____ 2. _____

3. _____ 4. _____

Activity : Fill water in a glass jar as shown in the picture. Then put marble, coin, dried leaf, wooden plank, straw etc., in the jar. Ask your friends to tell what happened to each object that you have put in water by observing it.



Some objects float in water and some sink.

Activity : Put some small objects in the water. Write what happened to those objects.

Objects that float in water	Objects that sink in water
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Think :

- A raft does not sink in water. Why?
- What objects are used to immerse the wooden plank in water? Why?

Activity : Fill water in two glass jars as shown in the picture. Now pour sugar to one jar and charcoal powder into another and stir.

Did the sugar and charcoal powder dissolve in the water? Observe and write here.

_____

_____

Some objects dissolve in water. This is called **solubility**. Some objects do not dissolve in water.

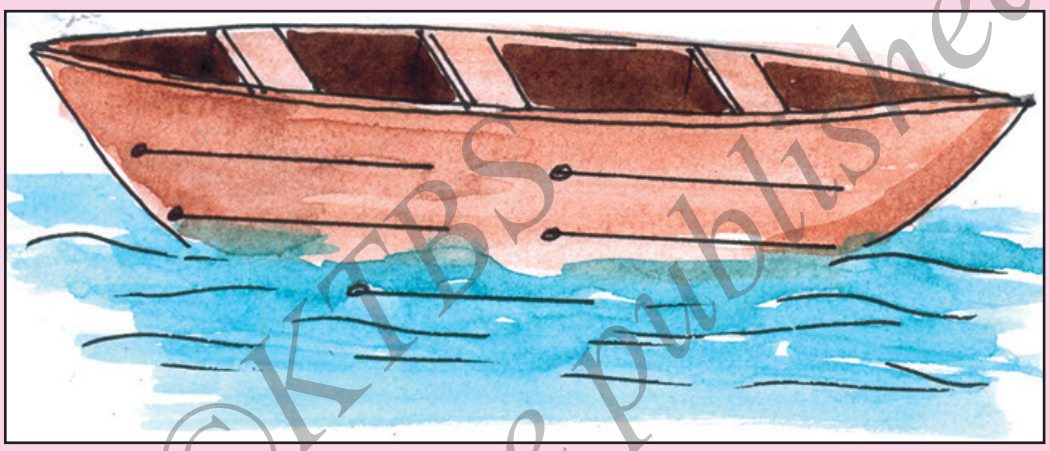
Activity: Put the given objects in the water and stir. Observe and write what happened to these objects.

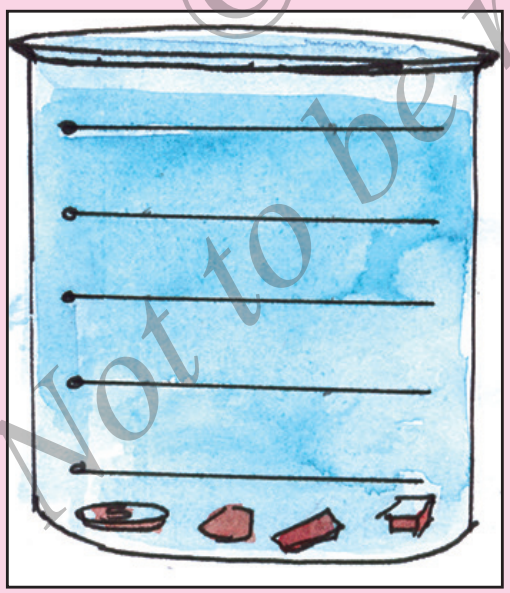
salt, sand, sugar, kerosene, turmeric powder, sugar candy, coconut oil,milk.

Soluble objects in water	**Insoluble objects in water**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

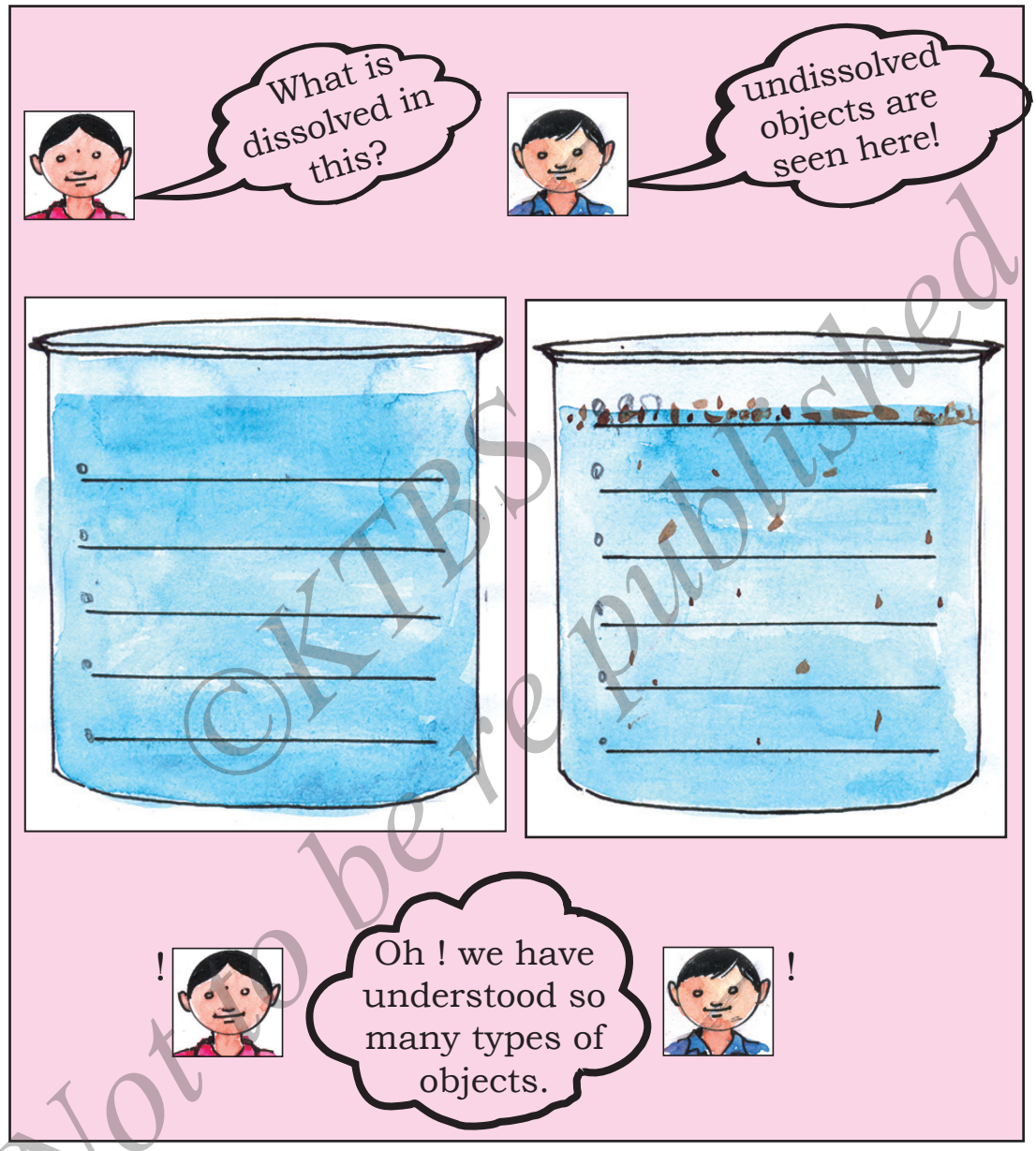
Activity : Write examples in the space provided.

What shall I write here?





Shall I write sunken objects?



Based on the arrangement of particles, matter is identified in three physical states, namely **solids, liquids** and **gases.** Apart from this, matter can be classified as elements, compounds and mixtures. You will learn about this classification in the next lesson.

LESSON -12

ELEMENTS, COMPOUNDS AND MIXTURES

In our daily life we make use of different kinds of matter. The matters available in nature consist of molecules or compound molecules. When these compound molecules are subdivided, elements are obtained. The smallest unit of the element is called **atom.** Atom is the smallest unit of an element having same properties. Some atoms easily combine with others and form different substances. Depending on the atoms present in the substances, they are classified as **elements, compounds** and **mixtures.**

After learning this lesson you,

- classify the matter into elements, compounds and mixtures.
- recognise the differences between element, compound and mixture.

Elements

Elements are made up of very small particles. These are formed by particles with same properties.

Example : Oxygen - O
Hydrogen - H

Elements cannot be subdivided chemically and cannot be synthesized by other elements.

Some elements are naturally available whereas some other elements are artificially prepared.

Example : Natural element - Gold
Artificial element - Plutonium.

Elements are classified as metals and non metals. You will learn about metals and non metals in higher classes.

Compounds

When two or more elements combine chemically, compound is formed. There are groups of atoms of different elements in it.

When two are more elements combine chemically in a specific ratio and form a substance of new property it is called a **compound**.

Example : Water - H_2O

Water is a compound formed by the chemical combination of Hydrogen and Oxygen in the ratio 2 :1

Molecular formula is used to represent a compound.

Know this : Representing the number of atoms in a molecule using chemical symbols is called molecular formula.

Molecular formula represents the elements of a compound as well as the number of atoms. A compound does not possess the properties of its constituent substances.

Example : Sugar is made up of carbon, hydrogen and oxygen. But sugar does not possess any of their properties. The constituents of compounds cannot be separated easily.

Know this : Take sodium chloride(salt) which is used in daily life. It is a compound formed by sodium and chlorine. Though both sodium and chlorine are poisonous, the salt formed by their combination is not poisonous. We use this in daily life.

Mixtures

We see many mixtures in our daily life. Mixtures are substances consisting of two or more substances.

If two or more substances (elements or compounds) are mixed together in any ratio, such that they do not undergo any chemical change, but retain their individual properties, then the resulting substance is called **mixture**.

Example : Soil is a mixture of sand, clay, many types of salts and residues of plants and animals.

Fill in the blanks with suitable words

1. Element consists of a group of same type of _____
2. Compound consists of a group of atoms of different _____
3. A compound is _____
   _____
   _____
4. A mixture is _____
   _____
   _____
5. Give five examples to each of these.
   (Take the help of your teacher)
   Element _____
   Compound _____
   Mixture _____

Element, compound and mixture may be solid, liquid or gas

	Element	Compound	Mixture
Solid	iron	sugar	soil
Liquid	mercury	water	sea water
Gas	oxygen	carbon dioxide (at room temperature)	air

Differences between compounds and mixture

Compounds	Mixtures
1. When two or more elements combine chemically compounds are formed	When two or more substances mix physically, mixtures are formed.
2. The constituents of compounds are combined in definite ratio or proportion	The constituents of a mixture may be mixed in any proportion
3. The constituent substances of a compound do not retain their original properties after combination.	The constituent substances of a mixture retain their individual properties.
4. The constituents of compounds cannot be separated by simple methods (without chemical reactions)	The constituents of mixtures can be separated by simple methods.

LESSON - 13

AMAZING ENERGY

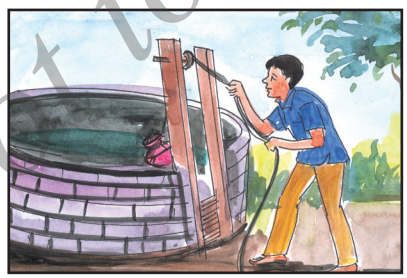
In the previous lesson, you learnt that the world we live in is made up of matter and energy. Human beings are the integral part of nature. They have understood many natural events of the environment and tried to find out the reasons for the changes that take place in the environment. They have learnt to think scientifically about the amazements of nature. We, in our daily life use the words like force, work, energy etc., What are these? Let us know about them.

After studying this lesson you,

- understand the meaning of work.
- understand that energy is needed to do work.
- understand the different forms of energy and give examples for the uses of different types of energy.
- recognise the change of energy from one form to another.
- recognise the significance of conservation of energy.

Work

In our daily life activities, the word commonly heard is work. But the word **work** has a definite meaning.



In the above picture both Ramesh and Rasheeda are doing activities deliberately using force.Ramesh can complete his work of lifting water from a well. But Rasheeda cannot move the wall in spite of several attempts.

It is said that **work** is done only when the force applied on an object makes that object move in the direction of the force.

Activity : Name any five works you do

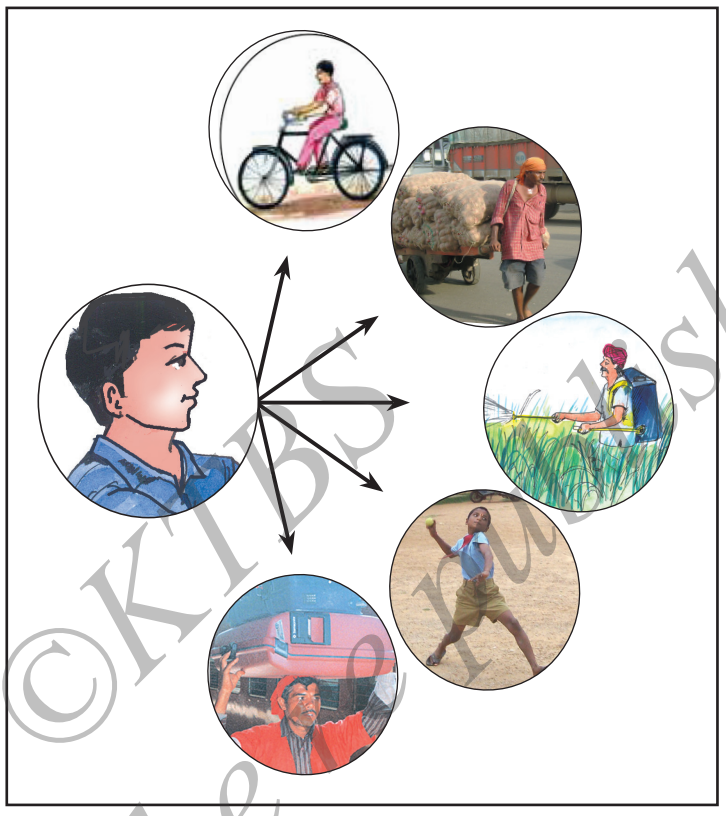
- Storing water
- _____
- _____
- _____
- _____
- _____

You have done all the above works by applying force. When force is applied on an object the object changes position or gets displaced. Work depends on the quantity of force applied on the object.

Activity : Write the names of three works you have done today.

- _____
- _____
- _____

Energy is essential to do work.



What works are being done in the above picture. Write it in the space provided below.

- _____
- _____
- _____
- _____
- _____

Activity : Teacher engages the students in different activities in groups.

For Example,

- watering the plants
- drawing
- arranging desks systematically in the classroom.

Think : Why are the above activities called works?

We are engaged with one or the other activity to fullfil our needs. These activities are called work. We use energy to do work. We get tired when we do more work. People who work hard, use more energy to do work.

Think : Can you lift the wooden table in your classroom, without the help of others.

We will be able to work only when we have energy. Less energy is required to do simple work, more energy is required to do tough work.

Activity : Try to lift your and your friends' school bags. How many bags can you lift at a time?

We get the energy required to do work from food. We get the energy for doing several works from different sources in the environment.

For Example,

We use physical energy. Motor vehicles run by fuel energy to carry loads. Solar energy is essential for plants to grow. Every work is related with the energy required to do it. If work is a needful activity, then energy is essential to complete the work.

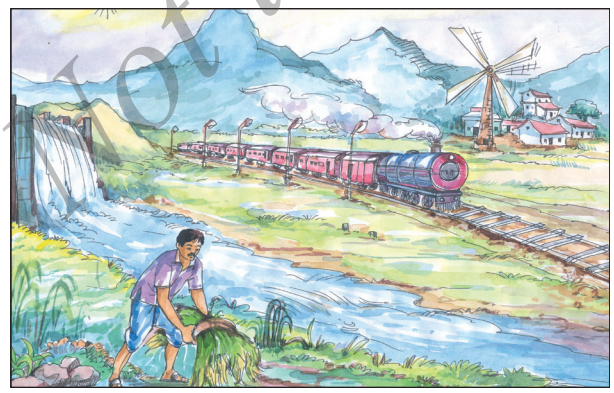
Work is also defined as, making an object move from one place to another. Energy is required to displace any object from one place to another.

Think : Are there any works which could be done without using energy?

Different forms of energy and use.

Flying aeroplane in the space, running vehicle on land, sailing boat/ship on water, electrical appliances which are used to ease our daily works, all use one or the other form of energy.

Observe different forms of energy in the picture given below.

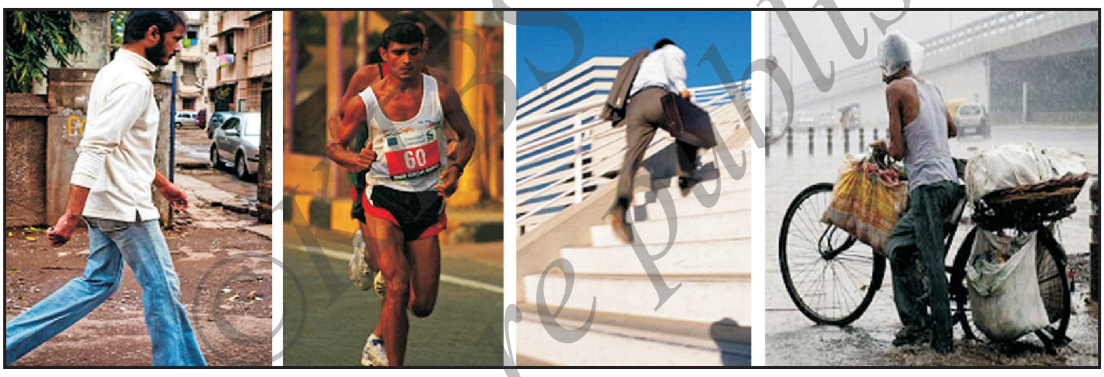


Activities happen not only by human beings but also several activities take place naturally in the environment. Energy is essential for all these activities to take place. Let us know, which is that essential energy?

Different types of works depend upon its related energy. There is a natural energy in the environment. Sun, air, water, coal etc., are the sources of energy used for certain daily activities in the environment. Let us learn about the different forms of energy.

1. Muscular energy

Activities like walking, climbing, pulling, pushing etc., need muscular energy. This energy is released by chemical changes in our body.



Think : Why do our elders insist we take nutritious food?

Write any four works you do using muscular energy.

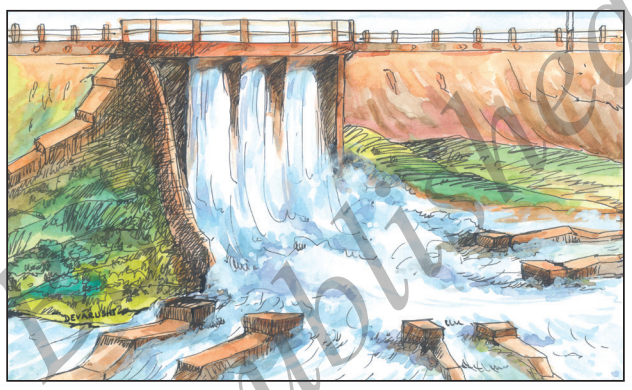
- _____
- _____
- _____
- _____

Read and learn : Muscular energy can be increased by proper food and regular exercises.

2. Mechanical energy

Energy of an object by virtue of its position is called **potential energy** and the energy due to its motion is called **kinetic energy**. Sum of potential energy and kinetic energy is called **mechanical energy**.

Water stored in a dam possesses potential energy. When the stored water in the dam is allowed to outflow through crest gates then potential energy gets converted into kinetic energy.



Write any two works you do at your home using mechanical energy.

- _____
- _____

Know this

Mechanical energy

Potential energy

energy possessed by a body by virtue of its position

Kinetic energy

energy possessed by a body by virtue of its motion

3. Heat energy

We do our daily works by getting heat from energy like fire wood, sun, fuel etc.,

Write any two works done in your home using heat energy.

- _____
- _____

Activity : Rub your palms rigorously for sometime and touch your cheeks. How do you feel?

Here muscular energy gets converted into heat energy.

We cook food, boil water and do other works using the heat energy from fuels, fire wood, gas, kerosene etc.

During winter season condensed oil bottles are kept near the hearth flame or in the sunlight. Why? Think and write.

_____

_____

Think : What would be the reason for the vibration of lids of vessels kept on burning stove for cooking food?

Heat is released when fuel is burnt. Coal is used as fuel in thermal power stations to produce electricity.

Know this : Thermal power station is established at Raichur.

Think : What is the cause of heat energy in charcoal used iron box?

4. Solar energy

Sun is the main source of all energies on the earth. The energy we get from the sun is called **solar energy**. Living organisms depend on solar energy for their survival. Plants prepare their food using sunlight. This process is called **photosynthesis**.

Think : What would have happened if there was no sunlight?

Activity : Discuss with friends or elders and write.

- During summer, wet clothes exposed to direct sunlight dry very fast. How?

  _____

  _____

- Water level decreases in ponds and wells during summer. Why?

  _____

  _____

- People wait for sunlight during winter season. Why?

  _____

  _____

- Why is solar water heater used?

  _____

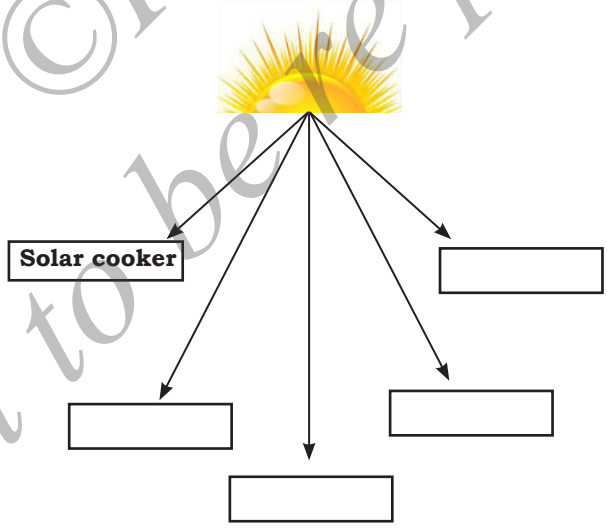
  _____

Observe the pictures given below.Identify where solar energy is used.






Activity : Write the names of solar energy devices that you have seen or used.



Activity

- Collect the pictures of solar energy devices and prepare a chart.
- Collect the information about the use of solar energy and compose a poem or talk about it.

Use of solar energy for different works reduces the use of electricity and prevents pollution of the environment.

5. Wind energy :

Air is one of the sources of energy. Moving air (wind) possesses energy. This is called **wind energy**.

In ancient times, people used to make boats and ships sail on the oceans with the help of wind.

Wind mills rotate due to the fast movement of wind. The turbines rotating due to this wind energy, produce electricity.

Discuss with friends/elders and write.

• Wet clothes spread over a rope for drying, flutter. Why?	_____ _____
• Why do trees like coconut and arecanut fall down during rainy season.	_____ _____
• What happens when a kite is held against the blowing wind?	_____ _____
• Wind wheel rotates only when somebody runs, holding it. Why?	_____ _____
• Why do lanterns have glass covers?	_____ _____

Write about the works done by wind energy.

Example : Production of electricity from wind

- _____
- _____
- _____

Activity

Make a wind wheel and enjoy running by holding it.

Wind has enormous energy. By using this energy many works could be done. Naturally available wind is used as energy and we must learn to protect ourselves from the disasters caused by wind.

Think : What are the adverse effects of cyclones? Collect the pictures related to it and discuss with friends.

6. Stored energy of water

Flowing water is a source of energy. In order to use water as a source of energy, a dam has to be built across a river and water must be stored in it (potential energy). **Stored water** is allowed to flow from a higher level to fall on turbines. Due to the force exerted by running water turbines rotate fast and produce electricity. These are called **Hydro electric power generating stations**.

Write the names of dams you know, and put (✓) mark to the ones you have visited.

1. _____ 2. _____

3. _____ 4. _____

5. _____ 6. _____

Visit a library. With the help of books, list out the dams built across rivers and hydro electric power generating stations in Karnataka.

Dams	Hydro electric power generating stations
1. _____ 2. _____ 3. _____	1. _____ 2. _____ 3. _____

Efforts of man in producing electricity by using water energy is to be appreciated.

Name the works which can be done by using water energy.

- _____
- _____
- _____
- _____

Know this : Energy produced by the ocean tides is called **tidal energy.**

Naturally available water is very precious. Hence it must be used moderately. The electricity which is produced with more effort and expense should also be used moderately and energy should be conserved.

Write two situations where we can save electricity.

- _____
- _____

Think : What would have happened if there was no electricity?

Know this : Reservoirs producing Hydro electricity are called **hydro electric power generating stations.**

Do this : (Take the help of elders)

- Collect rain water during rainy season, and use it for some works.
- Make use of rain water harvesting.
- Make use of soak pits for the proper use of water.

7. Electrical energy

Now-a-days most of our daily work is being easily done by the help of electricity. Is it possible to do more work in less time using electricity.

Write any four works done, using electrical appliances in your home.

Electrical Appliance	Work
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____




Electricity is supplied to houses and other places from electric power generating stations. Electrical appliances must be used carefully.

8. Bio energy

The gas produced by decaying agricultural waste, plant residues, animal dung etc., in the absence of air, is called **bio gas**. It is used for cooking. The energy available from biogas can be converted into electricity and may be used for many works.

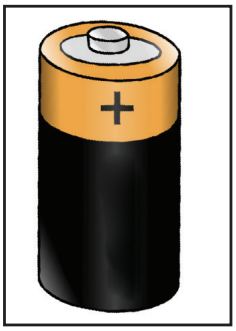
Write here the works you know that can be done using bio energy.

- _____
- _____
- _____
- _____
- _____

Activity : If you know the ways of producing useful things out of wastes, prepare the useful things with your friends.

Bio energy obtained from agricultural waste helps human beings to maintain healthy environment.

9. Chemical energy



Chemical energy is produced by the chemical reactions that takes place in the substances.

Example : Chemical reaction in electric cell produces electricity.

10. Fuel energy

One more energy available in the nature is **fuel energy.** Fuel is the natural source of energy which is combustible, produces heat and usually gives out light. This can be converted into electrical energy, heat energy and mechanical energy.

Activity : With the help of your teachers/elders, write the fuels used in the following

_____

_____

_____

_____

_____

_____

_____

_____

If you have appliances which make use of fuels in your home, write them below.

- _____
- _____
- _____
- _____
- _____
- _____

Know this : Fuels are the various minerals and their products. These are available in the earth's crust. These are exhausted gradually and require a long period for their reformation.

Fire wood is also a fuel. Burning of fire wood gives heat. By using this heat energy it is possible to cook and do other works.

Think : Write the instances where fuel is used unnecessarily

- _____
- _____
- _____

Fuel, the natural resource must be used moderately to protect our environment. Solar energy must be used more instead of conventional fuels.

Activity : Arrange a debate in the classroom about the pros and cons of fuel.

Energy is available in different forms from natural sources.

Write the different forms of energy that you have learnt.

1. _____ 2. _____
3. _____ 4. _____
5. _____ 6. _____
7. _____ 8. _____
9. _____ 10. _____

Think :

- Is it possible to store and use energy?
- Is electricity stored in cells? Is it possible?

Change of energy from one form to another

The energy available from sources like sun, water, wind, food, chemical reaction are present naturally in the nature. The energy found in different forms gets changed and become useful for human life. **For Example,**

- Fuel energy gets converted into mechanical energy (to run vehicles)
- Fire wood gets converted into heat energy (to cook food)

Write the changes in the form of energy in the following activities.

Activity	Form of energy	Form of changed energy
running of petrol car	chemical energy (fuel)	mechanical energy
drum playing	muscular energy	sound energy
ironing the cloths		heat energy
drying up of pappad in the hot sun	solar energy	
cooking food using bio gas		
glowing of an electric bulb by rotating turbine.		

We learnt from examples that energy gets converted from one form to another form.

Write other examples for change of energy from one form to another form.

- _____
- _____
- _____
- _____

Conservation of energy

Energy can neither be created, nor be destroyed. It can be converted from one form to another form. Energy remains in one or the other form.

If energy released by natural source like sun, wind, water, fuel etc., is used moderately we can save energy.

Use the clues given in the brackets and write which alternative energy can be saved by doing the activities given below. (fuel, chemical, electric, charcoal)

Activity	Saved Alternative energy
travelling by bicycle	_____
washing clothes by hand	_____
producing electricity from wind	_____
cooking food using bio gas	_____
not to put on the radio when there is no electricity.	_____

Which alternative energy can be used for the following activities instead of conventional energy. Write using clues given in the bracket.

(solar water heater, bio gas, solar cooker, solar cells)

Activity	Alternate energy used
instead of hearth	_____
electric geyser	_____
cooking rice on the hearth	_____
electric bulb	_____
listening to radio by using electricity	_____

While doing work one can use alternate energy.

Example : Using solar energy instead of electrical or fuel energy.

Energy which fullfils our needs is very essential for the survival of living beings. If we use energy gained by the body from food and energy gained from the environment for other activities carefully, the capacity of work can be increased.

LESSON - 14

THE SKY

Watch the sky in the evening from the play ground after playing the games. You will see some stars here and there, in the hazy sky. When the sky becomes clear you can see countless stars. You will be also able to see shooting stars. During the rainy season thunder, lightning, cyclonic winds, rains etc., are common. Are you eager to know how all this takes place? It is day when the Sun rises and it is night when the Sun sets. The Moon is seen at night. Shall we find out how these changes take place in the sky?

After studying this lesson you,

- know about the Sun and its family
- understand the shape and size of the Earth, its movements, causes of day and night.
- know about the meteors, asteroids and comets.
- understand the movements of the Moon and its phases
- know why the Earth is an unique planet among the other planets.

The Sun and its family

The Sun and its family is known as the **Solar System**. It comprises of 8 planets, 173 satellites, thousands of asteroids, meteoroids and comets.

Know this

- The stars are self luminous celestial bodies. The Sun is also a star.
- The solar system is a part of a galaxy which is known as the **Milky way**.

The Sun : The Sun is a star. It is closer to the Earth than any other star. Therefore, it looks bigger and brighter than all other stars. It is the centre of the Solar System. It exerts a gravitational pull on all its members, which orbit around it.

The Sun provides light and heat to us. It appears to rise in the east and set in the west. Do we not feel that the sun is moving around the Earth? Is this true?

The heat and light of the sun is essential for human beings, plants and animals.

Know this

In ancient times people thought that the Sun, the Moon and the planets were orbiting the Earth. This was known as **Geo-centric model**. It was expounded by **Claudius Ptolemy**.

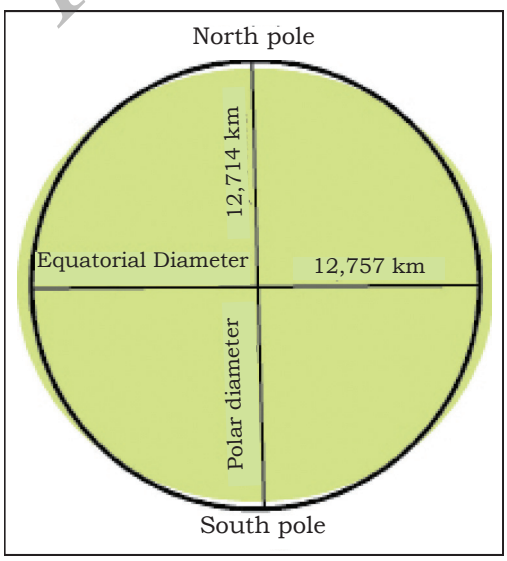
Arayabhata, the first Indian astronomer and mathematician proposed that the Earth and other planets revolved around the Sun. This is known as **Helio-centric model**. **Nicolaus Copernicus**, **Johannes Keplar** also supported this model. Later **Galileo Galilei** an Italian mathematician and physicist invented a telescope and using it, further supported the Helio-centric model of Copernicus.

The planets : A celestial body orbiting around the Sun along an elliptical orbit, is called a **planet**. Every planet has its own path of movement which is known as the **orbit.** The Earth also has its own orbit. The planets are non-luminous bodies. They receive light and heat from the Sun.

The Earth : It is our home and it is a unique planet in the Solar System. It occupies the third place from the Sun. It is the only planet of the solar system where there is life, because it has ideal conditions for life, such as temperature, water and suitable atmosphere with life supporting gases.

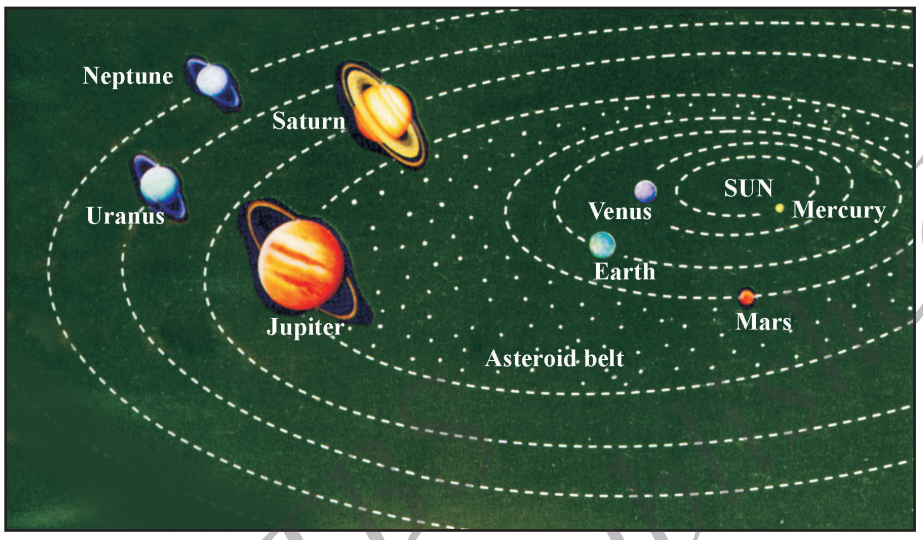
Here is a picture, viewing the Earth from the Moon.

The Shape of the Earth : It is confirmed by the scientists that the Earth is slightly flattened at the poles and bulging at the equator. Such a shape is called **Geoid**, meaning **earth-shaped**. It denotes the earth is not completely round or circular in shape.



Size of the Earth : The Earth is the **fifth largest** planet in the Solar System. Its equatorial diameter is 12,757 km and the polar diameter is 12,714 km. This shows that the polar diameter is less than the equatorial diameter by 43 km. It denotes that the Earth is spherical in shape. The total surface area of the earth is 510 million square km.

Solar system- Sun's family



Answer the following questions with the help of the above picture.

- How many planets are there in the Solar System?

  _____

- Write the names of planets in order.

  _____

  _____

- Which is the nearest planet to the Sun?

  _____

- In which planet do we live?

  _____

- Which is the biggest planet in the Solar System?

  _____

- Which is the smallest planet in the Solar System?

  _____

- Which is the farthest planet from the Sun?

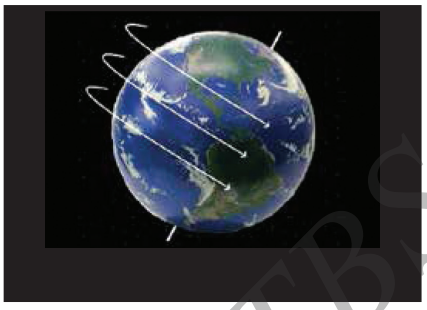
  _____

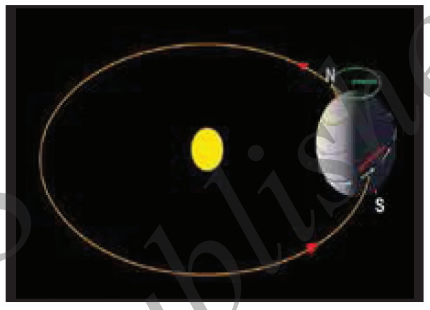
- What position has the planet Earth from the Sun?

  _____

The Movements of the Earth

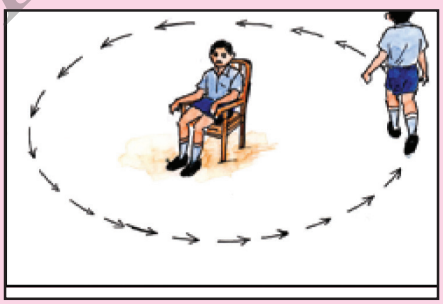
The earth has two movements. They are the rotation and the revolution. The Earth spins continuously on its axis from west to east. This is called **rotation**. The Earth also revolves around the Sun along its orbit. This is called **revolution**. The earth continues to rotate on its axis while it is revolving around the Sun.





Activity : Ask two students to stand a short distance from each other. One student represents the sun and the other represents the earth.

The student who represents the sun should sit on the chair. Mark an elliptical circle around the chair, 2 or 3 feet away from the chair. Ask the student who represents the earth to spin himself and revolve around the chair along the elliptical path.(in anti clockwise direction)



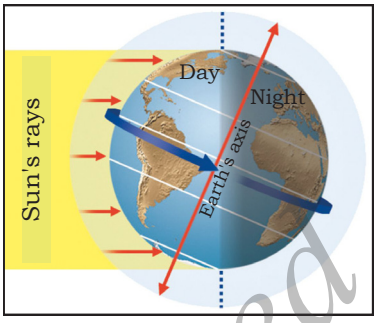
Discuss the following questions.

- Is it possible for the student representing the earth to see the student representing the sun by sitting always on the chair?
- How many times has the student representing the earth faced the student representing the sun?
- How many times has the student representing the earth shown his back to the student representing the sun?

When the student representing the earth shows his face to the student representing the sun, then it is assumed that it is day. When he is showing the back, then it is assumed that it is night.

What do you learn from this activity?

Day and Night : During the Earth's rotation one side of the earth faces the sun and receives light. This part of the Earth has day(light), the other side of earth does not receive light and has night(dark). Since the earth rotates from west to east, the Sun appears to rise in the east and set in the west.



Know this : The earth takes 24 hours to complete one rotation. This is called a day. The earth takes $365\frac{1}{4}$ days to complete one revolution. This is called **a year.** The day and year are a result of the earth's movements.

The Earth is Marvelous : As mentioned earlier the earth is the only planet that has life. Make a list of factors found on the earth to sustain life.

_____ _____ _____

_____ _____ _____

Know this : About 71% of the earth's surface is covered by water and 29% by land. The earth is surrounded by the atmosphere. Atmosphere has oxygen which is very essential for respiration of organisms, nitrogen and carbon dioxide which is essential for the preparation of food and nutrition of plants. The water which is essential for living beings is avaiable on the Earth through the process of water cycle. How is it possible?

Life on earth has become possible because of the suitable distance between the Sun and the Earth, ideal climate, variety of soils, which supply food and water to the plants, suitable environment etc., which are present on the earth. Hence, the Earth is a marvelous planet.

So far we have learnt about the earth which is the third planet from the Sun. Now let us learn about the other members of the solar system.

You have learnt that there are 8 planets in the Solar system. In the order of their distance from the Sun, the names of the planets are - **Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune**. Earlier Pluto was the 9th planet of the solar system. Recently it has been considered as a dwarf planet and is no more a planet of the solar system.

Know this : Till 2005, Pluto was considered as the 9th planet. As it did not have all the characteristics of the planet it was considered as a dwarf planet.

Mercury : It is the nearest planet to the Sun. It has no water and is the hottest planet. So it has dry climatic conditions. It has a rocky surface, large craters and mountains. It revolves around the Sun faster than any other planet. It is brown in colour.

Venus : It is the second planet from the Sun and smaller than the earth. It is the brightest planet in the solar system. It is also known as **morning star, silver star and evening star**.

Mars : It is the fourth planet from the Sun and is also known as the **Red planet.** Its red soil is formed because of iron oxide. It has huge volcanic craters, giant canyons and canals. The canals are now as dry as dust. Thus it looks like a desert.

Jupiter: It is the fifth planet from the Sun and the **largest planet** in the solar system. It is 1300 times bigger than the earth. It is a gaseous (gas) giant planet. It has a Great Red Spot. It is three times the size of the earth. There are thin icy and dusty rings around this planet.

Saturn : It is the sixth planet from the Sun and the second largest planet in the solar system after Jupiter. It is also made up of gases. It has thousands of rings of ice, rocks and dust. That is why it looks beautiful and attractive.

Uranus : It is the seventh planet from the sun. Like Jupiter and Saturn it is made up of gases. It is seen as a blue-green disc. It has rings, which are opaque. It is covered by thick clouds.

Neptune : It is the eighth planet from the sun. Its composition is similar to that of Uranus. Its colour is bright blue. It is one of the coldest planet in the solar system due to its great distance from the sun.

A list of period of rotation and revolution of the planets is given (on the basis of Earth's timings) With the help of this table answer the following questions.

Planets	Duration of earth's rotation	Duration of earth's revolution
Mercury	59 days	88 days
Venus	243 days	225 days
Earth	24 hours	$365\frac{1}{4}$ days
Mars	24hrs, 37min	686 days
Jupiter	10 hrs	12 years
Saturn	10hrs.39min	$29\frac{1}{2}$ years
Uranus	17hrs.13min	84 years
Neptune	16hrs.23min	165 years

1. Which planet takes the least time to complete one revolution around the sun? Why?

2. Which planet takes the most time to complete one revolution around the sun? Why?

3. Which planet takes more time to complete one rotation than its revolution.

_____

- **Features of some planets are given below. Mention the name of the planets against each of them.**

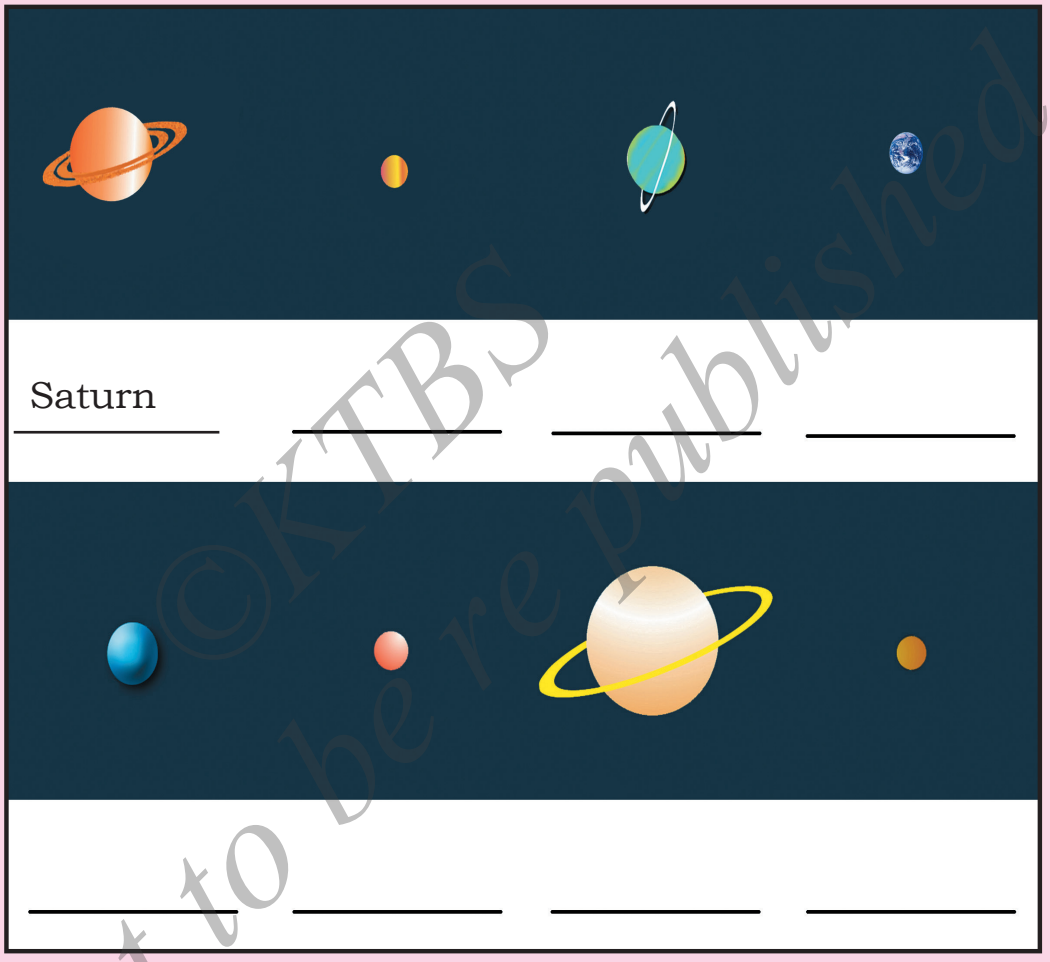
1.	red planet	
2.	brightest planet	
3.	biggest planet	
4.	blue-green colour planet	
5.	only planet that has life	
6.	its day is longer than its year	

- **Identify the name of the planets in the letter grid given below.**

Example; Jupiter.

M	A	R	S	H	A	Q	M	U	B
A	B	C	D	A	J	W	X	R	Y
W	C	V	E	N	U	S	E	A	B
X	D	Q	P	R	P	G	D	N	F
S	E	N	M	L	I	J	K	U	L
A	F	E	A	R	T	H	M	S	N
T	G	H	I	J	E	O	P	Q	R
U	H	Q	M	E	R	C	U	R	Y
R	S	T	U	W	X	Y	Z	C	D
N	E	P	T	U	N	E	W	X	Y

Activity : Observe the pictures of the planets and write their names in the blank space. One Example is given.



Meteoroids : Small fragments of rocks and debris in space are called meteoroids. When they enter the earth's atmosphere, they burn up in the atmosphere due to friction and a streak of light is produced. They are known as **shooting stars.**

Asteroids : Small rocky celestial bodies revolving around the sun are called asteroids. Most of them are located between the orbits of Mars and Jupiter.

Know this : The elliptical path followed by a celestial body revolving around the sun is called orbit. i.e the orbit.

Comets : A comet is an icy body that gives out gas or dust. They revolve around the sun. They can be seen in the night, when they come close to the earth. When they come close to the sun they produce a long tail which is made up of gas and dust. Some comets appear at regular intervals. Hailey's comet appears once in 76 years. The last time it appeared was in 1986. When will it appear again?

Activity : Draw a picture of the solar system in a chart or prepare its model with the help of your teacher. Exhibit it in the classroom.

Activity: Under the guidance of the teacher along with your friends draw 8 elliptical circles on the ground. You stand in the centre of the circle representing the sun. Ask your friends (8 members) to stand on each circle and revolve along their own orbit to represent the planets in the solar system. This activity will help you to understand the movements of the planets in the solar system.

The Earth's Satellite - The Moon :

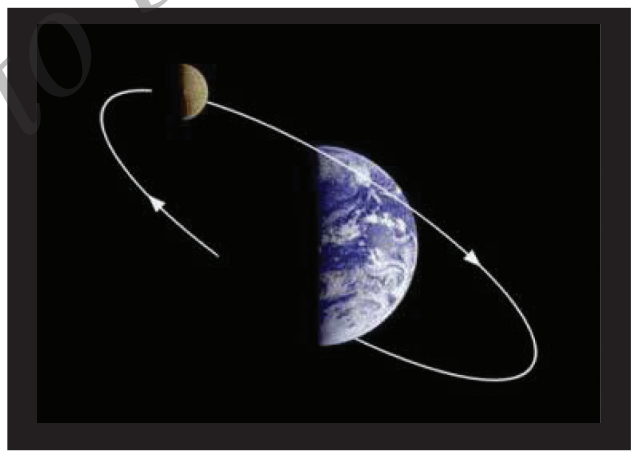
A celestial body revolving around the planet is called a **Satellite.** The Moon is the only natural satellite of the Earth. It revolves around the earth. It does not have light of its own. It reflects the light from the sun during the night.

Think : If you are living on the Moon, will the earth appear as the Moon to you?

Movements of the Moon : The Moon has two movements. One is **rotation** on its axis and the other is **revolution** around the earth.

Know this : The Moon's rotation takes 27.3 days and its revolution around the earth takes 29.5 days.

As the moon revolves around the earth, its position in relation to the sun changes from night to night. As a result we can see the Phases of the moon. The changes in the moon's visible face is known as **phases of the moon**. You will learn more about this in the higher classes.

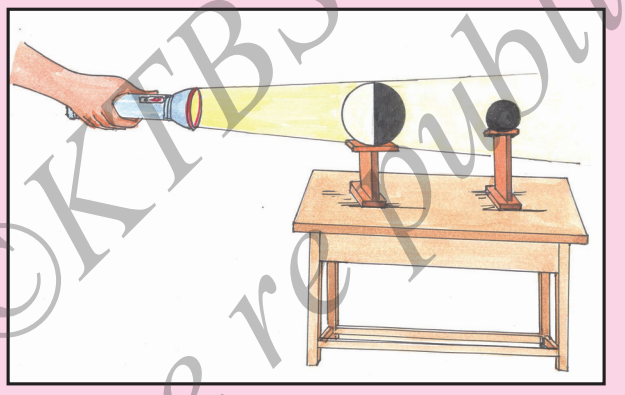


When the moon is completely dark we call it **New moon**. When we see its bright side totally, we call it **Full moon**.

Know this :

- **One day** : The duration taken by the earth to complete one rotation on its axis is called as day.
- **One year** : As the earth rotates on its axis the duration taken by it to complete one revolution around the sun is called a year.
- **One month** : The duration taken by the moon to complete one revolution around the earth is called one month.

Activity :



As shown in the picture keep one bigger ball 4cm away from a smaller ball on a flat surface. Darken the room, take a torch and spread the light from different angles on the plain surface. Discuss the activity with your friends and answer the following questions.

- Is the light falling completely on the outer surface of any ball?
- When the light falls on one ball, is it possible to make complete darkness due to its shadow which falls on the other ball?
- Consider the torch light as the sun light, big ball as the earth, small ball as the moon, discuss about the light - shadows.

Do this : Look at the sky every day at night. Observe the shape and direction of the visible part of the moon. Notice the glittering stars. Keenly watch one particular galaxy and its movements. Then answer the following questions

1. Is the shape of the visible part of the moon always the same?

_____

2. On which day is the moon fully visible? What is that day known as?

_____

3. On which day is the moon not visible? What do we call that day?

_____

4. Is the moon visible daily at the same place and at the same time?

_____

5. Are the stars located in the same place? or Is their location changing?

_____

6. Can we get a particular shape by joining some stars. Draw a diagram of stars and display it in the class room.

_____

Observe : For the above activity you should watch the clear sky at night at a particular time for a minimum of 30 days. Then answer the above questions.

Think : When we watch a live broadast of Olympics or other global level games, it was day in different countries of the world while it is night in our country. How is it possible?

Activity : The name of the planets and duration visiblity are given below. Observe this along with your friends.

Planet	Morning	Evening
Venus	April to June	_____
Mars	January to March	May to December
Jupiter	February to May	September to December

Who belongs to which category? Write in the table.

Sun, Moon, Mars, Mercury, Jupiter, Venus, Saturn and pole star

Star	Planet	Satellite

- **Answer the following questions.**

1. What is solar system?

_____

_____

2. Which is the natural satellite of the earth?

_____

3. Explain the characteristics of the following celestial bodies.

Celestial bodies	Important characteristics
Meteoroids	_____ _____
Asteroids	_____ _____
Comets	_____ _____

Do you know this?

- The Sun and other celestial bodies orbiting the Sun is called Solar System.
- The two natural satellites of Mars are Phobos and Deimos
- Jupiter has more than 67 natural satellites and Saturn has more than 62 natural satellites.
- The Uranus has minimum 27 natural satellites whereas Neptune has 14 natural satellites.
- Mercury and Venus do not have any natural satellites.
- As we know, the earth is the only planet of the solar system on which there is life.
- The artificial satellites which revolve around the Earth are prepared by man for multiple purposes. Aryabhata is the first man-made satellite of India.
- Neil Armstrong was the first human being to land on the Moon.
- Jupiter, Saturn, Uranus and Neptune are called **Gas giant planets**.

LESSON - 15

OUR INDIA - PHYSICAL DIVERSITY

India is our country. It has a variety of physical features such as Himalayan mountain ranges, very high peaks, plateaus, vast plains, river systems, deserts, coastal plains and islands. Together they make India-our country, which is unique in its natural setting. Besides, India is the home for a variety of plants and animals.

After studying this lesson you,

- understand the physical map of India.
- know about the Himalayan mountains, plateaus, plains, coastal plains, river basins and desert.
- understand how the factors of natural environment influence the life of the people.
- know the effects of physical factors on art and architecture.
- know about the important characteristics of weather and the climate of India.
- know about the plants and animals of India.

Physical divisions of India

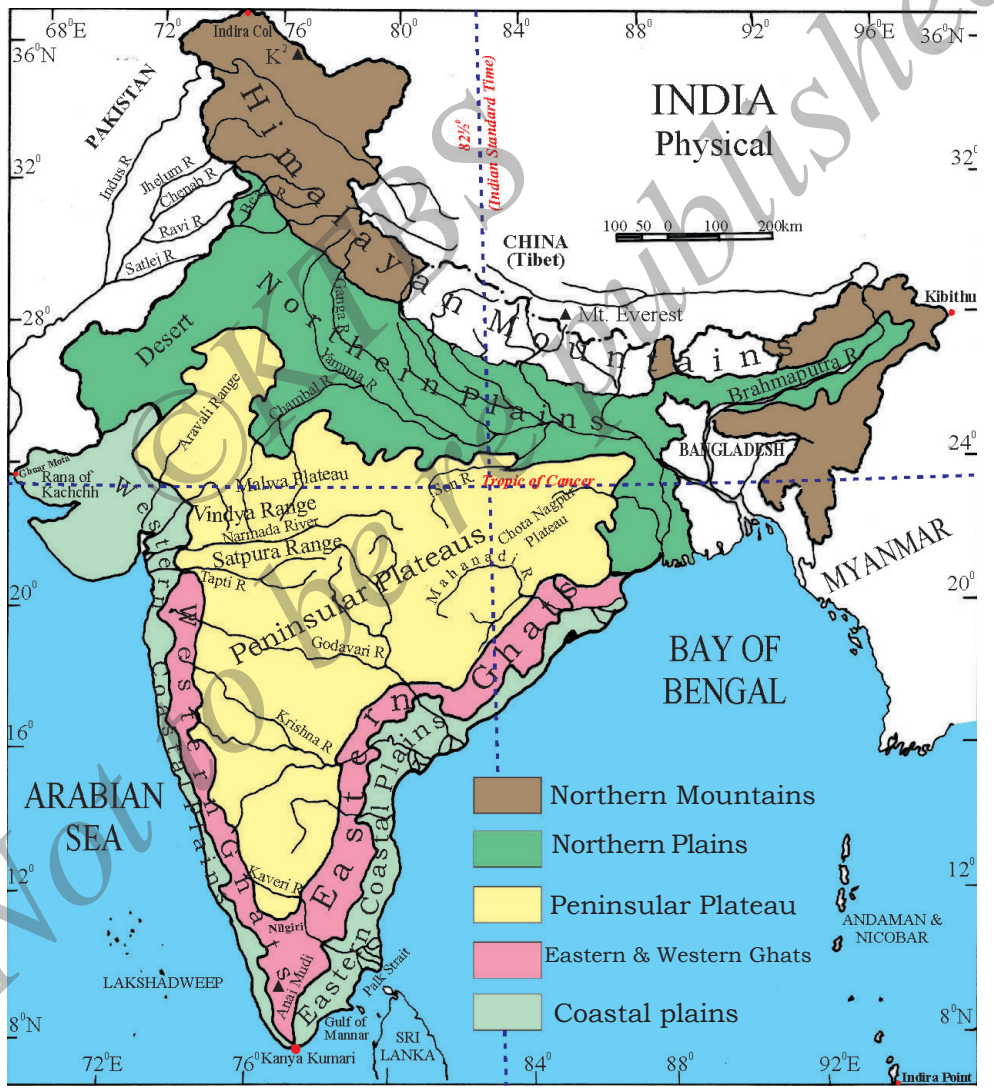
Look at the map given in the next page. It shows the major physical divisions of India. With the help of this map you can easily identify the varied physical features of India.

Instruction to the Teacher

Provide the facility to the students to refer to the Geo-maps on the computer by downloading the maps to understand the abstract concepts.

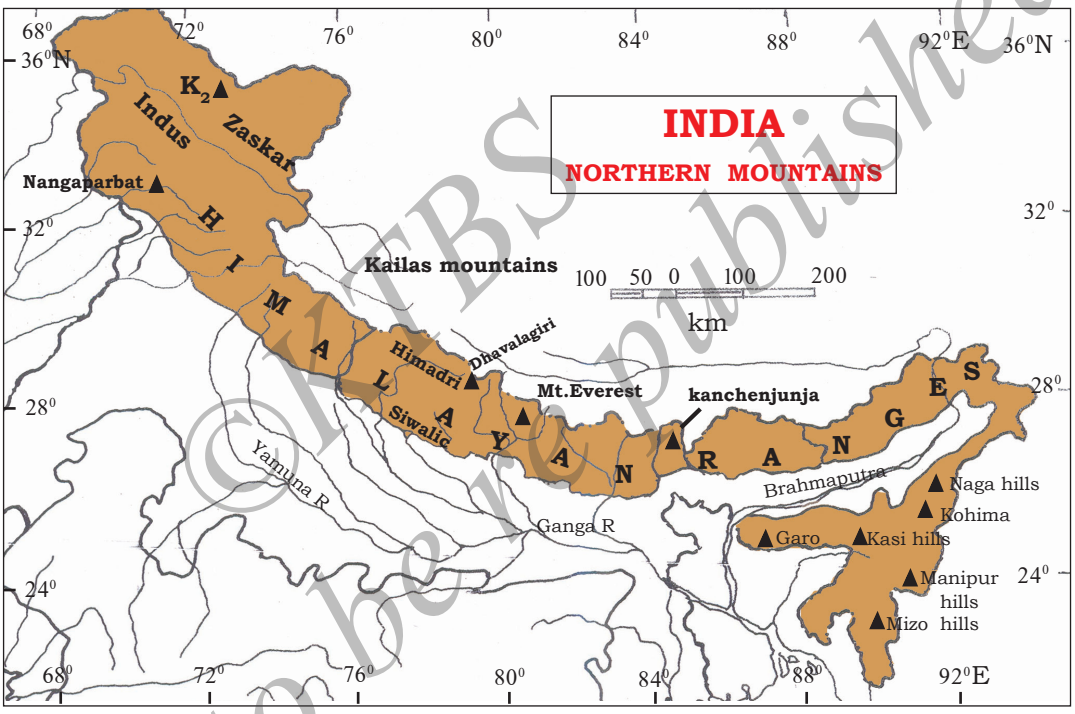
What do you see in the map?

When you look at the land surface of India, don't you notice the differences from one region to another? You see various types of landforms such as mountains, hills, plains, plateaus, valleys, gorges etc. These differences, that we see on the land surface are known as **physical features**.



Now let us study about the major physical divisions of India.

1. **The Northern Mountains :** They consist mostly of the **Himalayan ranges.** When you look at the northern part of the map you will notice that the Himalayan ranges extend from Kashmir to Meghalaya. The Himalayas are the highest mountains in the world.



Characteristics of the Himalayan ranges.

- They are covered with snow. Hence they are called **Himalayas**.
- They have many high peaks.
- There are many deep valleys and gorges.
- There are glaciers and the highest mountain passes.
- There are hot springs.
- There is a variety of plant and animal species.



Advantages

- Himalayas prevent the cold winds from central Asia blowing into India.
- They are the source of many North Indian rivers.
- They check the monsoon winds and cause heavy rainfall.
- They are like a gigantic wall and are natural northern frontiers to control foreign invasions.

Know this

- A **mountain range** is a group of or chain of mountains found close together and extend to thousands of kilometes.
- The Aravalli, the Western Ghats, the Eastern Ghats, Vindhyas, Satpura ranges are the other important mountain ranges in India.
- The population is less because of the severe cold in the Himalayan ranges.
- The Indus, the Ganga, the Yamuna and the Brahmaputra rivers have their source in the Himalayan ranges.

Answer the following questions.

1) Find out the names of animals which live in the foot hills of the Himalayas and make a list of these animals.

_____

_____

_____

_____

_____

2) An unusually wide and long valley in the lower Himalayas is called **Doon**. **For example, Dehradun** in India. It is a popular tourist place. During summer people visit this place. Why do they visit it?

_____

_____

_____

3) If there are mountains/mountain ranges/ghats near or surrounding your place, write their names.

_____ _____

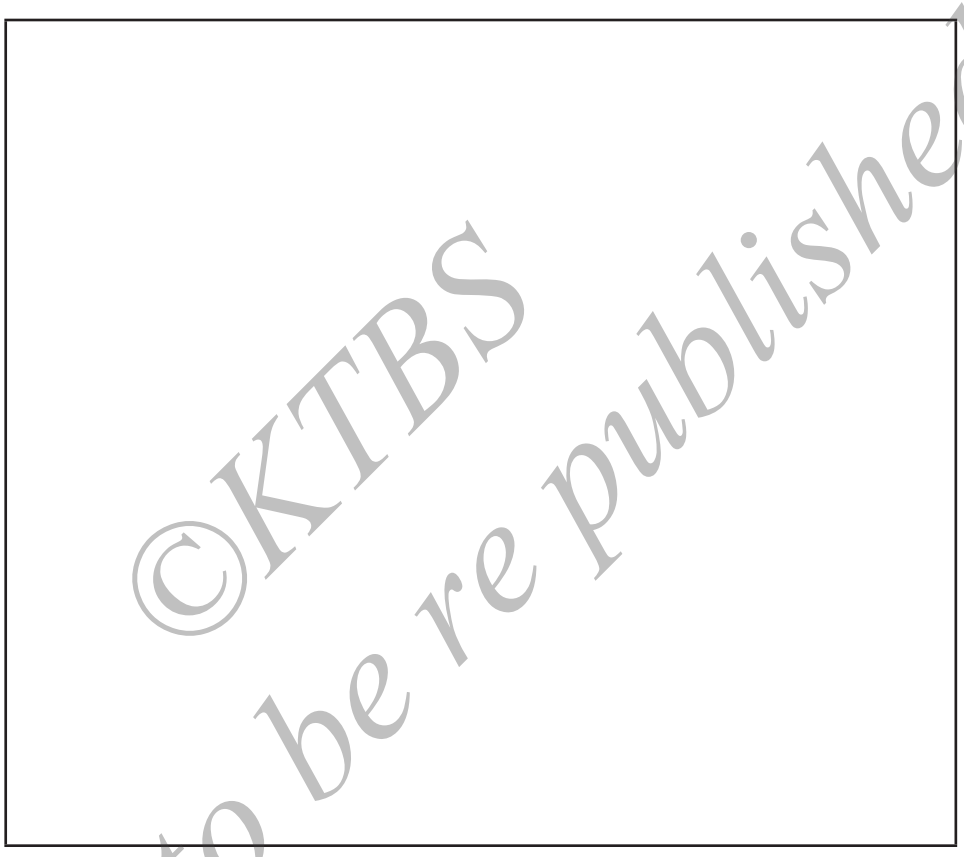
_____ _____

_____ _____

_____ _____

_____ _____

4) Collect a picture of any one animal living in the foot hills of the Himalayas. Paste it in the blank box. Write about it in 3 sentences.



_____

_____

_____

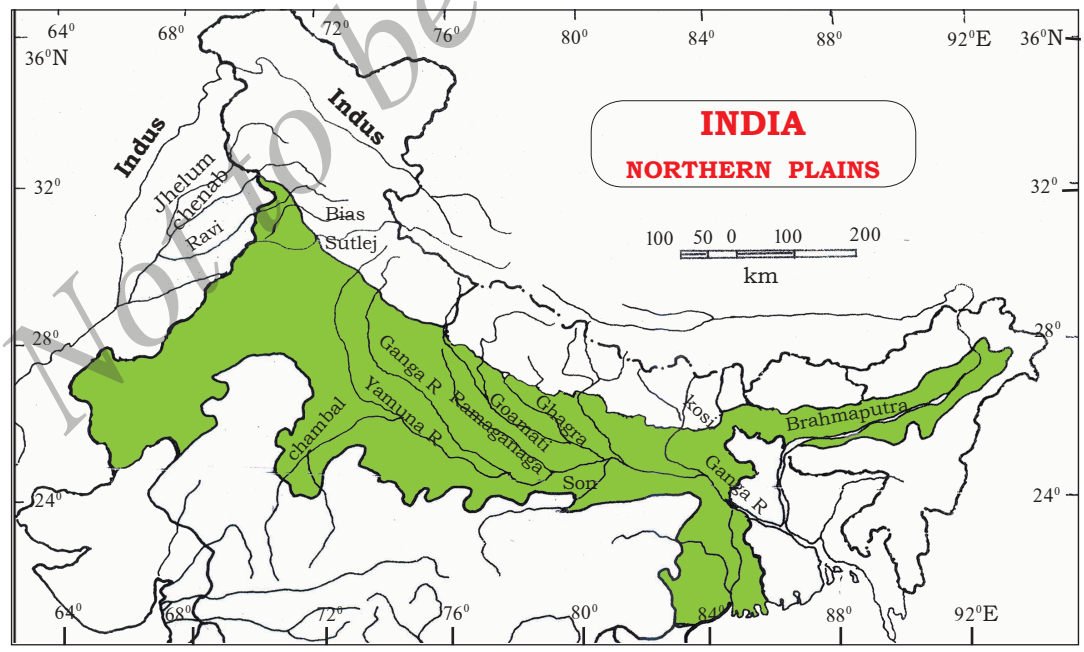
Do you know this?

- Mt. Everest is the highest peak (8,848m) in the world.
- Mt. Godwin Austin or Mt. K_2 (8,611m) is the highest peak in India.
- Mullayanagiri (1,913m) is the highest peak in Karnataka
- Annaimudi (2,665m) is the highest peak in South India.

Know this

- Air cools as we climb higher places.
- The rivers which have their source in the foot hills of Himalayan ranges have plenty of water even during summer.

2. The Northern Plains : When we talk about the plains, we remember a playground. Usually a playground is plain in level with no obstruction to play games. Similarly, there are plains located to the south of the Himalayan ranges. They are very vast, fertile and in level. Locate this physical division on the map.



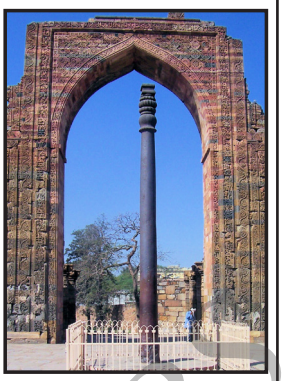
Know this

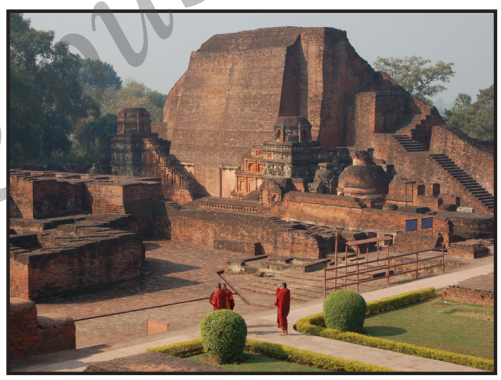
- The Northern plains of India are formed by the deposition of alluvium carried by the rivers while flowing from the Himalayan ranges. These plains are known as **Indus, Ganga and Brahmaputra plains.**
- These plains are situated between the Himalayan mountains and Peninsular plateaus.
- The Sutlej, the Ganga, the Brahmaputra and their tributaries flow through these plains.
- The soil of these plains is very fertile due to the deposition of alluvium by the rivers.
- Crops such as wheat, paddy, maize, sugarcane etc., are grown here.
- These fertile plains are known as the **Food store house of India.**

Observe : Wherever there are river plains, there is plenty of water. Therefore agriculture, rearing of animals, transport facilities, trade and commerce and industries are developed. Hence these plains are densely populated.

The different types of physical features have influence on the tradition and culture of the people of that area. Many towns and cities of Harappa civilization have developed on the river banks. Even now there are many famous historical cities and pilgrimage places situated on river banks. On account of the ideal conditions for settlement many empires ruled in the Northern plains. **For example,** Maurya, Mughal and Gupta empires. You will learn about this in the higher classes.

Observe these pictures. Where do you find them in India? Mention the places. (Take the help of the teacher)

The plains are more helpful for the growth of architecture. Since these regions have level land it is easy to construct big buildings. The availability of different types of rocks, sand, metal, wood, plant fibres, soil, ideal site, craftsmen etc., also helped in the development of architecture. **For example**, huge palaces were constructed in Rajastan, the Taj Mahal in Agra was built by using marble rock.

Observe

- The inner walls of Kollur, Dharmastala, Kukke Subramanya temples in Karnataka are made of wood.
- Houses in Kashmir valley are built using logs.
- Buildings were constructed using Kadapa rock in Raichur district(Karnataka) and parts of Andhra Pradesh.
- In recent years red granite rocks are used for the construction of buildings in Bagalkote and surroundings.
- Belur and Halebidu in Karnataka and most of the temples of Tamil Nadu are built by using soapstone.
- Sandstone cave temples are found in Badami of Karnataka.

Answer the following questions :

1. The Northern plains are fertile. Give reasons.

_____

_____

2. The people prefer to live in the plains of a river. Why?

_____

_____

3. Make a list of the important rivers and crops of our state.

Rivers	Crops

4. Mark the river Ganga, Brahmaputra and Yamuna on the outline map of India.

5. A challenge to you (discuss in groups)

It is very essential to maintain cleanliness on the banks of rivers. Now the rivers of India are affected by water pollution. The harmful activities of human beings destroy the sources of drinking water which is essential for life.

Do you know how the rivers are polluted?

- Plastics, several types of toxic waste and effluents of industries are dumped into the river water.
- Idols or images, painted with different chemical paints are immersed in the river water.
- The chemical effluents which are released by industries are let into the river water.
- Big cities produce a large amount of garbage in different forms which is thrown into the rivers and the water gets contaminated.
- Mining activities also cause pollution of rivers. **For example,** river of Kali, Bhadra etc.,

Now the Ganga river water cleaning programme is under progress. Is it not correct to do this? What are the benefits of cleaning river water? Write here.

_____

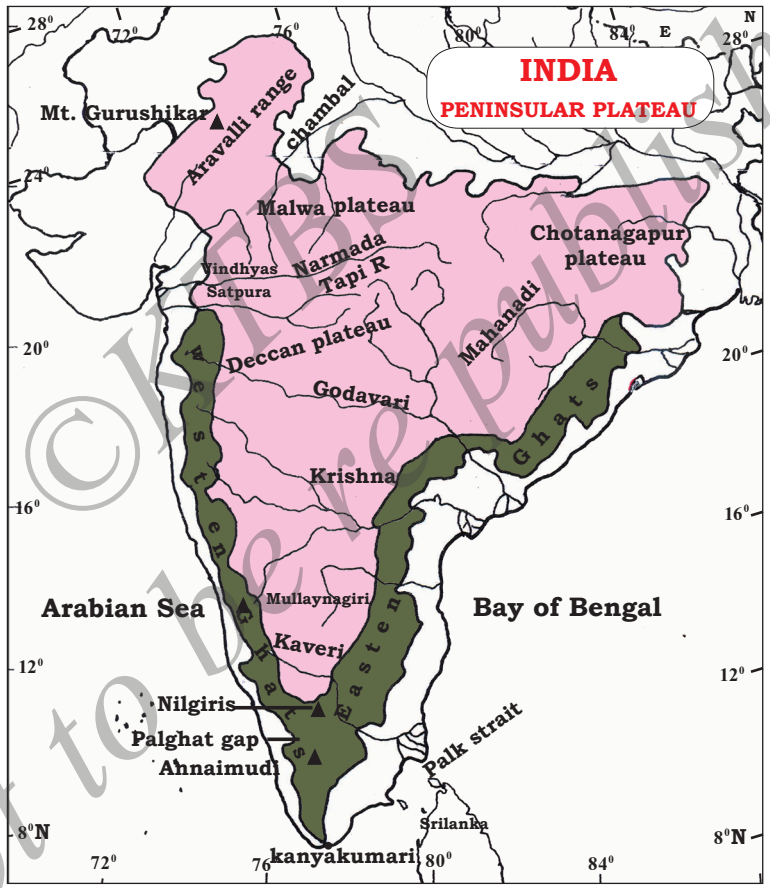
_____

_____

_____

_____

3. The Peninsular Plateau : Identify the Narmada river on the map of India. The Narmada-Sone rift valley divides the Peninsular plateau into two major parts. The northern part is called the **Malwa plateau** and the southern part is called the **Deccan plateau**. The Aravalli range lie to the north-west of Malwa plateau and the Vindhyas lie to the south. **Mt.Gurushikhar** is the highest peak in the Aravallis.



The Satpura, Maikala, Rajmahal, Amara Kantaka ranges lie to the north of Deccan plateau. The Western Ghats are in the west and the Eastern Ghats are in the east. The Annamalai, Cardamom and Palani hills are to the south of Western Ghats. The Western ghats and the Eastern ghats meet at the Nilgiri hills. Udhagamandala (Ooty), a famous hill station, is situated here. Many rivers of peninsular India have their source in the Western ghats.

Characteristics of the plateau

- It is an upland with an extensive, almost level surface which is bounded by steep slopes.
- This landform is an extensive area of relatively flat land.
- The Deccan plateau is the largest plateau in India. It is made up of the ancient hard rocks.

Advantages

- The peninsular plateau is rich in minerals.
- The rivers flowing across it are helpful for the cultivation of crops.
- There are many waterfalls which are useful for the generation of hydro-electricity.
- It is favourable for agriculture, rearing of animals and industries.

Several empires also ruled in the peninsular plateau. The Rashtrakutas, Chalukyas, Hoysalas, Vijayanagaras, Kadambas, the Gangas and Bahamani sultans established their empires here. You will be studying more about them in the higher classes.

Answer the following questions.

1. Mention the names of the two important plateaus in India.

_____

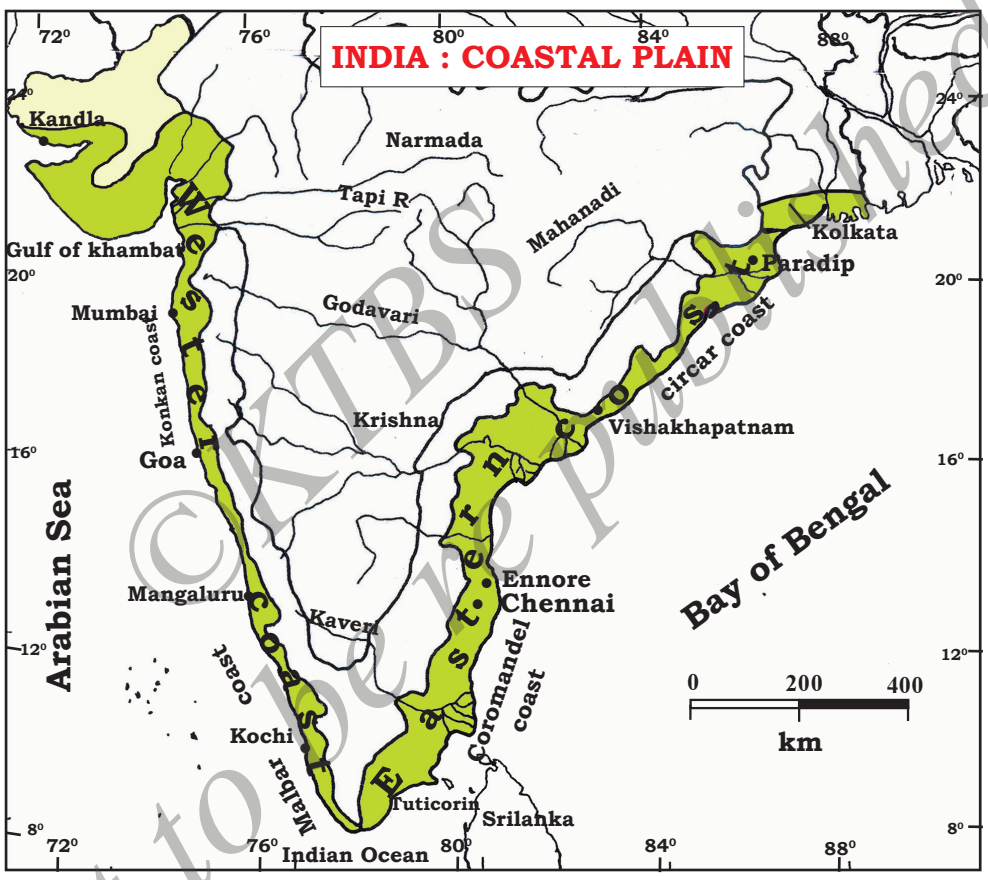
_____

2. Mention the important historical places located in the peninsular plateau.

_____

_____

4. The Coastal plains : Now let us study about the coastal plains. A flat low lying land between the coast and higher land in the interior is called **coastal plain**. India has a long coastal plain. Let us see where they are located in our country.



How is the coastal plain extended?

Observe the map. The western coastal plain lies between the western ghats in the east and the Arabian sea in the west. It extends from the Gulf of Kuchh (Gujarat) in the north to Kanyakumari in the south. The eastern coastal plain lies between the eastern ghats and the Bay of Bengal. It extends from the Gangetic delta in the north to Kanyakumari in the south.

Both the coastal plains of India have major ports. Kandla (Gujarat), Mumbai, Nhava sheva (Maharasthra), Marmagoa(Goa), Nava Mangaluru (Karnataka), Kochi (Kerala), Tuticorin, Chennai, Ennore (Tamilnadu), Vishakhapatanum (Andhra Pradesh), Paradip (Odisha), Haldia and Kolkata (West Bengal) are the major sea ports of India.

New Mangaluru port ranks 9th (in importance). It is known as the **Gateway of Karnataka**.

The important features of the Coastal Plains

Fishing is the main occupation of the people living in the coastal plains. So, most of the people eat fish and prawn. Spinach, ivy gourd, black eyed peas and sambar cucumber are also eaten for food. Paddy, arecanut, coconut, cashewnut, cardamom, banana and vegetables are grown here. The use of boiled rice is very popular. The houses here have steep sloping roofs, due to heavy rain.

Answer the following questions

- Which sea borders the coast of Karnataka?

  _____

- Which districts of Karnataka have coastal plain?

  _____

- Make a list of major crops grown in the western coastal plain of India.

  _____

  _____

- There is a demand for coastal food items of Karnataka. These are exported to other countries. What are they?

  _____

  _____

- The gently sloping strip of land bordering the sea, usually composed of sand and gravel is called **beach**. You can watch the sea as far as you can. The striking sea waves bring great delight to your mind and eyes. The Ullal, Malpe, Kapu, Om and Maravanthe beaches of Karnataka are attractive and beautiful. Which are the other famous beaches of India? Know and write here.

_____

_____

_____

- Observe the dress style and food habits of the fishermen living in coastal plains. Write 4 sentences about this.

_____

_____

_____

_____

- The sea coasts are highways for trade and commerce. Some ports provide shelter for ships. On the outline map of India mark and name the major ports along the eastern and western coasts.

_____ _____ _____

_____ _____ _____

- Collect pictures of a ship. Paste it in the given space. Write 3 sentences about its use.

_____

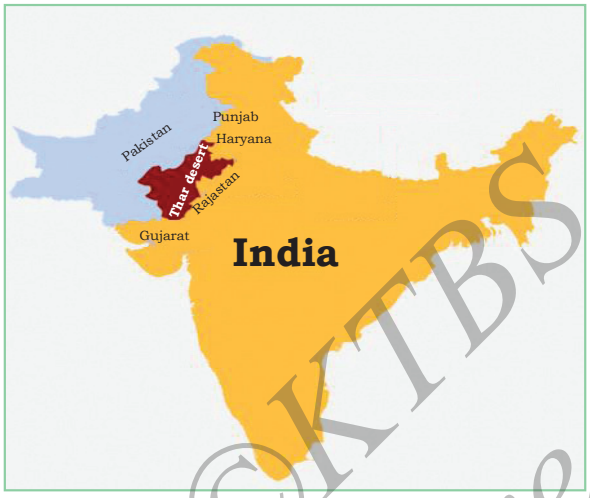
_____

_____

- Locate the following on the outline map of India - Mumbai, Nava Mangaluru, Chennai, Vishakhapatnam and Marmagoa.

Desert of India

Locate the state of Rajasthan on the map of India. One can notice that a large part of Rajasthan is a desert. This desert is named **Thar desert**. A part of this desert also extends into Punjab, Haryana and Gujarat states.



Features of deserts

- A desert is a vast, dry and sandy area with very little vegetation.
- The temperature is high and climate is dry.
- Scarcity of water due to scanty rain. A fertile area in a desert is formed where the water comes up, to the ground surface. This is known as **Oasis**.
- Those plants and trees which have special devices to withstand the long drought conditions are grown here. They are scrubs, cactus, accacia, thorny bushes etc.,

The Aravalli range extends into the eastern fringe of the Thar desert. It prevents the winds blowing from the east and this causes scanty rain fall. Therefore this part has dry climate. Find this area on the map and mark it.

Is there any relationship between desert and these pictures? Think about it.

The dry climate and the hot sun causes a feeling of severe burning in the body. For some relief from the heat, people wear long robes and turbans.

Lack of water and the blazing sun determine the type of desert animals. Camels are able to survive in the desert, because they have broad flat toes which are comfortable to walk on the sand. Their **humps** store fat and sufficient amount of water which lasts for many weeks. Camels are useful for transporting goods and carrying passengers in the deserts. That is why camel is called as **Ship of the desert.**

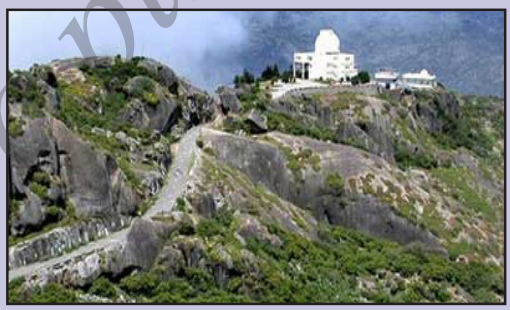
Do you know this?

- Agricultural activities are found around the Oasis. Bajra, jowar, maize, sesame, dates and chillies are grown here.
- There are some salt lakes in these deserts, known as **playas. For example,** Sambhar, Didwana and Sargol lakes.
- The **Sambhar** lake is the *largest salt lake* in India.

Know this

You have learnt that the factors of environment and climate have an effect on art and architecture. There are big and beautiful palaces built by experts which are the best examples of rare architecture in the desert. **Jaipur, Ajmer, Pushkar and Mt. Abu** are places, famous for such architecture in Rajasthan.



Answer the following questions

1. What is an Oasis?

_____

_____

_____

2. Write any 3 features of the deserts.

_____

_____

_____

3. Paste a picture of a camel in the given space and write 4 sentences about it.

_____

_____

_____

_____

Rivers of India

There are many river systems in India. They are one of the natural resources. There is diversity in their origin, direction of flowing and volume of water. Thus the rivers of India can be classified into two groups-rivers of North India and rivers of South India.

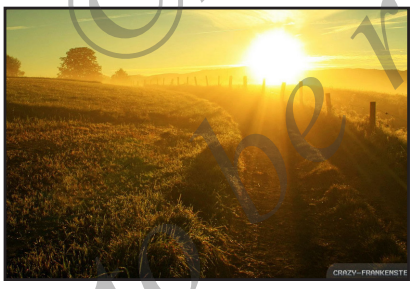
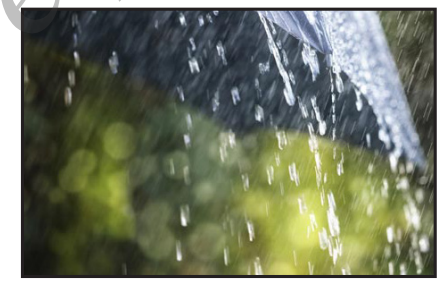
The Rivers of North India : The major river systems of North India are the Indus, the Ganga, the Brahmaputra and their tributaries. Most of them rise in the Himalayan mountains. They are perennial rivers. The northern plains are fertile due to the deposition of alluvium carried by the rivers of North India. They are best for agricultural activities. Famous ancient historic and pilgrim centres are situated on the banks of these rivers. **For example,** Delhi, Agra, Varanasi etc.,

The Rivers of South India : These rivers can be divided into the east-flowing and the west-flowing rivers. The important east-flowing rivers are the Mahanadi, the Godavari, the Krishna, the Kaveri, the Palar and the Pennar. They flow south east and eastwards and join the Bay of Bengal. The important west flowing rivers are the Narmada, the Tapi, the Sharavathi, the Kali, the Netravathi, the Zuari and the Periyar. They flow westwards and join the Arabian Sea. These rivers are short and swift, suitable for the generation of hydro-electricity as they have rapids and waterfalls.

In recent years the rivers, specially the Ganga-Yamuna rivers have been heavily polluted which has affected their purity.

The Climate of India

You have already practiced marking the Havaguna Nakshe (weather map). You have also learnt how to understand the daily weather conditions. What do the following pictures indicate?

India has a tropical monsoon type of climate. The term **monsoon** is derived from the Arabic word **Mousim** meaning periodic. Thus, the speciality of the climate of India is that it changes from one season to another.

Hence we can see the diversity in the climate of India. There are 4 seasons in India-winter season, summer season, south west monsoon season and retreating monsoon season. The weather changes from time to time during the day. Sometimes it is cool, another time it is hot and sometimes it is cloudy. Think. Why is it so?

The dry air, the changing monsoon winds and the natural hazards like cyclones adversely effect the climate of India. Consequently we find the sudden changes taking place in the climate.

The climate of India can be classified into 4 distinct seasons. They are

Seasons	Duration (months)
1. Winter	December, January, February
2. Summer	March, April, May
3. South-West monsoon (Rainy season/Kharif)	June, July, August, September
4. Retreating monsoon (Rabi season)	October, November

Identify the direction of South-West, South-East, North-East and North-West on the map of India. India receives heavy rain from the south west monsoon winds.

The movement of air over the earth's surface, from high pressure area to low pressure area is called **wind**. The winds which change their direction from one season to another are known as **seasonal winds**. **For Example,** monsoon winds.

Know this

- There are two rainy seasons in India. They are South West Monsoon Season from June to September and Retreating Monsoon Season from October to November.
- The Western coastal plains, western parts of the Western Ghats and North-eastern states receive heavy rainfall.
- **Mawsynram** in Meghalaya receives the highest rainfall in India.

Activity : The situations related to the effects of heavy rainfall are given here. Put (✓) mark to the suitable situation. If not suitable put (x) mark.

1. The people are very happy. ☐
2. The roads are flooded by water. ☐
3. No water is flowing in the streams and rivers. ☐
4. Electricity is cut off. ☐
5. Fodder is available for livestock. ☐
6. It is easy for fishing in the sea. ☐
7. The people may lose their houses and become refugees. ☐

- Collect the information which you have gained from the study of weather conditions in school. Explain about the changes in weather conditions in your school surroundings.

_____

_____

_____

- Which parts of India were affected for the last two years by cyclones. Collect information on them and write here.

_____

_____

_____

_____

_____

- Select a suitable picture, which shows destruction after heavy rain or continuous downpour. Paste it in the blank space.

Observe : Drought occurs when there is a failure in timely rainfall. There is no water for crops. Livestock and other animals wander about in search of water and may die. Due to lack of drinking water and excessive heat people are in distress and migrate to other places etc. These are the effects of drought.

A challenge to you

The earth is heating. The ground water is dried up and there is melting of snow in the Himalayan mountains. What are the reasons for this? Think about it and discuss with your friends. Write here.

_____

_____

_____

_____

_____

How are we benefitted by the broadcast of weather report in radio, TV and news papers? Make a list of the benefits.

_____

_____

_____

Diversity of plants and animals in India

Read the instructions about how you have seen the animals and plants given below. Mark (✓) to the applicable. If not, put (×) mark.

Animals	Actually seen	Seen in pictures	Never seen
			
			
			
			

Plants	Actually seen	Seen in pictures	Never seen
			
			
			
			

Just as there is a diversity in the physical features of India, there is diversity in the types of plants and animals found in India.

Instruction to the Teachers

Use geo maps, provide facility to the students to watch thick forest areas. Facilitate to look at the forests of Assam, Gir forest of Gujarat, Vegetation of the Himalayan mountains, forests of the Western Ghats, the Eastern Ghats, Anantha giri forests etc.

India has its own plant and animal resources. There are thick monsoon forests, grasslands, thorny bushes, scrubs, evergreen forests and mangrove forests. The deciduous forests are largely found in India. They are known as **monsoon forests.**

There are animal and bird sanctuaries, where elephants, tigers, lions, cheetas, bisons, deer, peacocks etc., and various birds are found. They are the major natural resources of India.

Remember : The forest areas in Malnad or Sahyadris, reserved forests of Nagarahole, Bandipura and Bhadra are the main natural resources of Karnataka.

Learn and write :

1) Mention the names of any 3 protected forest areas in India.

_____

_____

_____

2) Discuss with your friends about the endangered animals in India. Mention any 3 names of such animals

_____ _____ _____

Do you know this?

In order to conserve the biodiversity, census work of the biodiversity is under progress.

3) What are the problems arising from deforestation. Discuss with your friends and write here.

_____

_____

_____

_____

_____

4) What animals are living around your environment? Observe and make a list of them.

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Project work :

- To show the physical features of India, prepare a model of the landform of India under the guidance of your teacher.

  Required materials : cardboard, clay, cotton, gum, sand, red soil, water, colour etc.
- Collect information about Salumarada Thimmakka, Nagesh Hegde and Dr. Madhava Gadgil.

Children, recall what you have studied in this unit. Isn't the natural environment of India beautiful? We should appreciate its diversity. India's climate needs to be appreciated. We should protect our resources and prevent their destruction through harmful human activities.

LESSON - 16

OUR INDIA-POLITICAL AND CULTURAL

India, our country has its own geographical, historical, political and cultural background. It has a rich heritage. History has recorded that India was ruled for many centuries by several foreign rulers. Among the Europeans who came to India, the British ruled for a long period of 200 years. As a result of the fight for freedom from the British rule, India became an independent country on 15th August, 1947. Until then, India did not have a definite boundary. But after independence, it has a definite boundary. At present, India is one nation with the union of states. Let us be proud of our great country-India. Let us know about India.

After studying this lesson you,

- know about the geographical location of India in the world.
- understand the latitudinal and longitudinal extent of India.
- know about the neighbouring countries and water bodies surrounding India.
- identify the states and union territories on the map of India and name them.
- understand about Unity in diversity of India.
- know the significance of the national emblems.
- understand the diversity of India's art, literature and culture.

Let us take an oath for our country. All stand up.

India is my country. We Indians are brothers and sisters. I respect my country. I shall protect its varied resources and rich heritage. I am proud of my country.

Location of India

Let us learn about the geographical location of our great India. If anybody asks for your home address, would you not give the name of your village/town/city, its taluka, district, state and country? (Also you would give your post office pin code) In this manner, you can find out in which part of the world India is located. Observe this map.

India is situated in the southern part of Asia, which is the largest continent in the world. Latitudinally India extends from 8° N to 37° N. latitude and longitudinally it extends from 68° E to 97° E longitude. (See map of India, page 231) It shows that India lies entirely in the Northern Hemisphere and is at the centre of the Eastern Hemisphere. The Tropic of Cancer($23\frac{1}{2}$°N), a special latitude, passes through the middle of the country. It divides India into almost two equal parts, North India and South India. Hence India has tropical climate in the southern part of it and subtropical climate in the northern part.

Know this

- A set of imaginary lines drawn on the globe from west to east are called **Latitudes**. They are measured in degrees. There are 90° north and 90° south latitudes from the equator.
- A special latitude which divides the earth into two equal halves is called **Equator** (0°). The half of the earth to the north of it is called **Northern Hemisphere** and to the south of it is called **Southern Hemisphere**.
- The special latitudes are - the Equator (0°), the Tropic of Cancer ($23\frac{1}{2}$°N), the Tropic of Capricorn ($23\frac{1}{2}$°S), the Arctic circle ($66\frac{1}{2}$°N) and the Antarctic circle ($66\frac{1}{2}$°S)
- Longitudes are imaginary lines drawn on the globe, from the north pole to the south pole. They are also known as **meridians**. The longitude that passes through Greenwich in England is called the Prime Meridian (0°). The half part of the earth to the east of Prime meridian is called **Eastern Hemisphere** and to the west of it is called **Western Hemisphere**.
- There are 180° of east longitudes to the east and 180° to the west of **Greenwich Meridian**.
- There is a relationship between longitude and time.
- The latitudes and longitudes help to understand the position, distance and direction on the earth's surface

India is the 7th largest country in the world with respect to area and the second populous nation after China.

Know this

- Area of India : 32,87,263 square km
- Population of India : 121 crore (census 2011)
- The southern most point of India : Indira point
- The northern most point of India : Indira Col
- The western tip of India : Ghuar Mota
- The eastern tip of India : Kibithu

In the previous class you have learnt about Karnataka state. Let us once again recall what we have learnt.

- In which part of India is Karnataka state located ?

_____

- How many districts are there in Karnataka state? List them.

_____

_____

_____

_____

_____

- Which are the neighbouring states of Karnataka? Mention.

_____

_____

_____

Let us know the facts about India just as we have studied the facts about our state.

Instruction to the teachers

You should practice the use of Atlas by the students. Arrange to provide at least one Atlas for a group of 3 to 4 students.

1) India and its Neighbouring Countries

The neighbouring countries of India are - Pakistan and Afghanistan to the north-west, Nepal, Bhutan and China are to the north, Bangladesh and Myanmar to the east and to the south - east is Srilanka. It is an Island and it is separated from India by Palk Strait and the Gulf of Mannar.

Frontiers of India

Look here! Now let us look at the political map of India. In this map let us study how the states, islands and water bodies are distributed.

- Peninsular India is surrounded by the seas and ocean and has 7,516.6 km long coastline. This helps the growth of foreign trade, shipping, fishing and shipbuilding.
- The water bodies which surround India are the Bay of Bengal in the east, the Arabian Sea in the west and the Indian Ocean in the south.
- The Andaman-Nicobar Islands are in the Bay of Bengal and the Lakshadweep Islands are in the Arabian Sea.
- Observe the map of India where you can locate the water bodies surrounding India on three sides. Such a landform is called a **peninsula**. So South India is a peninsular.
- A piece of land surrounded by water on all sides is called an **island**. The Andaman-Nicobar and Lakshadweep are the islands of India.

Activity : Take the map of Asia or an Atlas. With the help of this, mark the neighbouring countries of India on an outline map of Asia and write here.

_____

_____

_____

2) Administrative Divisions of India

Look at the map of India once again. You can see the state boundary on the map. But there was no boundary line on the earlier maps, because, as mentioned earlier, before independence, India was ruled by several native dynasties and external forces. The country was fragmented into hundreds of small princely states.

After independence, in order to carry on smooth administration, the boundary lines of the states were reorganised.

The States Reorganization Act of 1956 was a major reform of the boundaries of the states of India, on the basis of languages.

There are a large number of languages in India. This indicates the diversity of languages. Of these, 15 languages have been recognised as official languages and are printed on Indian currency.

Activity : Get a currency note from your parents. Make a list of languages printed on it.

_____

_____

_____

- Which is the official language of our state?

_____

- Which are the languages of your neighbouring states?

_____

- Which is the language you speak at home?

_____

- Which is the official language of India?

_____

Know this : We use a language in our day to day activities. Understand the feelings of others and maintain harmony.

India is the 7th largest democratic country in the world. It is divided into 29 states and 6 union territories and one National Capital Territory which is Delhi. Since the states are divided on the basis of languages it becomes easy to understand their environment, economic, cultural and regional traditions. Every state contributes its speciality, towards the building of a great India. With the help of a map let us learn about the different states.

Activity : With the help of a map prepare a chart including the States and Union Territories, their capitals and mother tongue. Then display it in the classroom.

The Government of India is officially known as Central Government. It is the governing authority of the country's states and union territories. Its main offices are located in **New Delhi**, the capital of the country. The administration of the states is managed by the states themselves. This system is called **State Government.** Every state has its own capital for the purpose of administration. Then,

- Which is the capital city of Karnataka state?

_____

- With the help of your teacher/parents collect facts and complete the following sentences with suitable answers.

1. The official language of Goa is _____
2. The capital city of Nagaland is _____
3. The name of the present Chief minister of Jammu and Kashmir is _____

4. The present President of India is _____

5. The present Governor of Karnataka is _____

6. Recently Andhra Pradesh was divided into _____ and _____

7. The present Prime Minister of India is _____

8. The present Chief Minister of Karnataka is _____

The union territories are ruled directly by the Central Government. They do not come under any state. The Governor, appointed by the President of India is the administrator for the union territories. There are 6 union territories. They are, **Diu-Daman, Dadra - Nagara Haveli, Chandigarh, Lakshadweep, Puduchery, Andaman and Nicobar islands**. Locate them on the map.

Know this

- The 4 administrative divisions of Puduchery are : Puduchery, Mahe, Yanam, and Karaikal districts.
- New Delhi is the national capital of India.
- Chandigarh is the capital for both Punjab and Haryana states.

Activity

Observe the relationship of first two words. In the same way, write the fourth suitable word for the third word.

Example :

India	: Delhi	:: Karnataka	: Bengaluru
1. Kerala	: South	:: Kashmir	:
2. India	: Peninsula	:: Andaman	:
3. Union Territory	: 6	:: States	:
4. Bay of Bengal	: East	:: Arabian Sea	:

- **Complete this exercise with the help of an Atlas**

1	Neighbouring countries of India	_____ _____ _____
2	Islands of India	_____ _____ _____
3	Union Territories of India	_____ _____ _____

4	Northern states of India	_____ _____ _____
5	Southern states of India	_____ _____ _____
6	Small states to the North-east of India	_____ _____ _____

3) Unity in Diversity and Integration

Observe these pictures. Discuss with your friends about the diversities in these pictures.






The dress - costumes of the people seen in the pictures are different.

India is a land of many religions. Hence people follow variety of customs. Hinduism, Islam, Christianity, Sikhism, Buddhism and Jainism, are the major religions of India. Besides, followers of other religions are also found in the country. Thus, India is a land of many religions.

Project work :

There is also diversity in the culture of our state. Prepare a project on the basis of specialities in culture found in North Karnataka, South Karnataka, Coastal plain and Malnad region

(collect facts about food, clothes, festivals, folklore, games, art, crops, important celebrations, rivers etc.,)

Know this

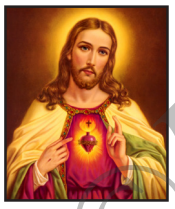
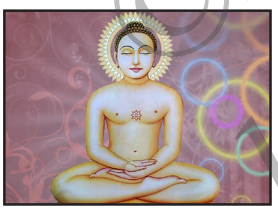
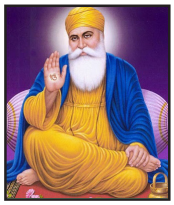
- People belonging to different religions live in the same street/road with love and affection.
- The people of all religions travel together in the bus, train, aeroplane etc.
- People of various religions participate in one another's religious festivals and functions and greet each other.
- The people belonging to different religions participate in the urusu, fairs, festivals and processions with devotion and excitement.

Respecting all religions, living together in peace and having the feeling that we are all indians is integrity.

Know this

In our country, there is diversity in landforms, river system, climate, types of soils, plants and animals, natural resources and methods of agriculture. Our occupations, religions, caste systems, languages, food habits, dress, customs and regional culture also have diversity. But we live together as people of one country. This is known as **Unity in diversity.**

Observe the pictures. Match the following by drawing lines.

	Christianity
	Sikhism
	Buddhism
	Hindusim
	Islam
	Jainism

Activity : Discuss with your friends and write the solutions for the following.

- Disputes of language, land-water, religion, border disputes of state/country.
- Water disputes of rivers flowing across two states.

_____

_____

_____

_____

Do this

- Wear the costume of different states for your school functions and exhibit integrity.
- Once in a week sing a song of good will with your friends.

4. National Emblems

- Name the national festivals of India.

_____

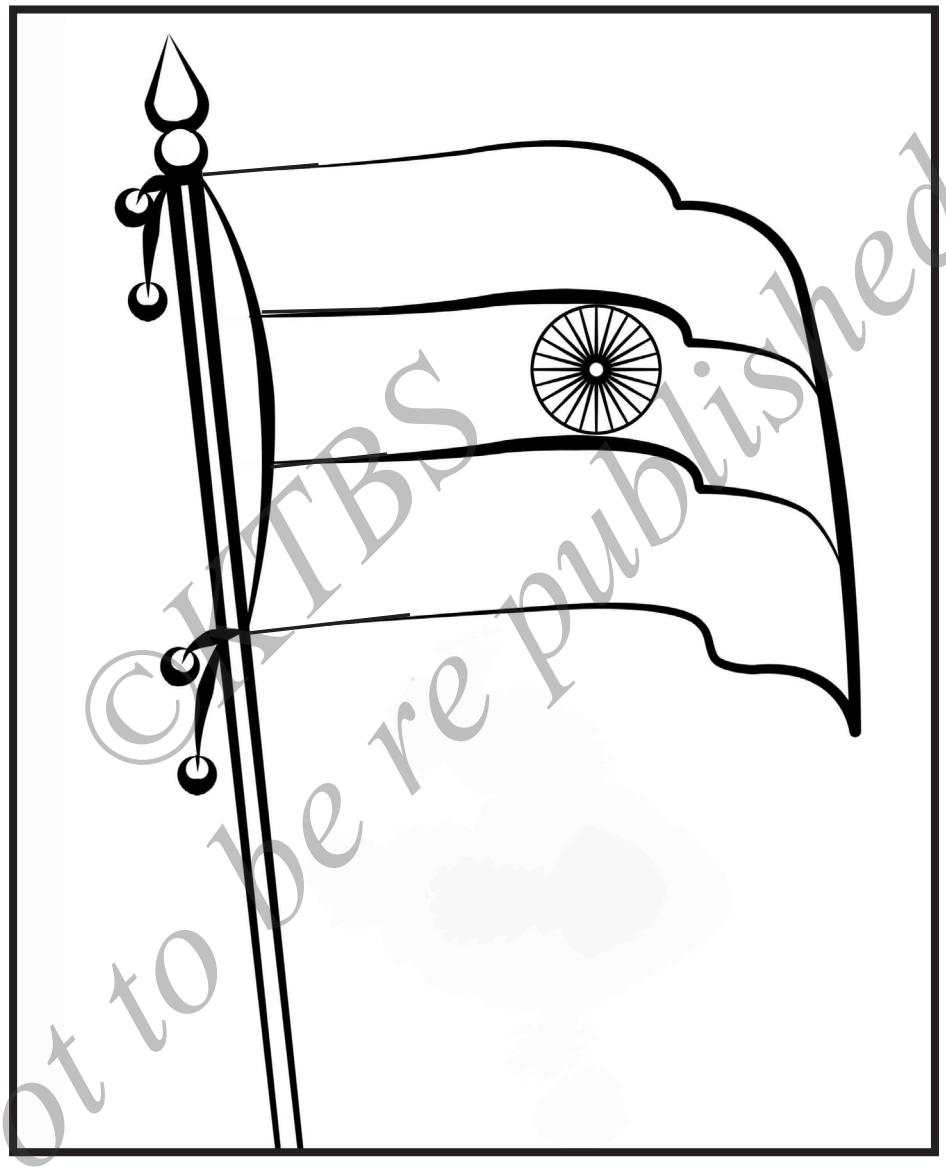
_____

- Do we not hoist the National Flag on national festivals? What are the colours of our National flag?

_____

The National Flag is one of the national symbols of our country. It is a horizontal rectangular tricolor(Tiranga) of saffron, white and green. Saffron stands for courage and sacrifice, white colour symbolises peace and purity and green is the symbol of fertility. The Ashoka Chakra is at the centre of the flag. It is the symbol of progress and movements. Our national flag represents India and has a special recognition in the international level.

- Paint the flag given below with suitable colours.



Observe

- Care should be taken to prevent the National flag from falling to the ground.
- The use of plastic national flag is an offence.
- National flag should be hoisted only after sunrise and lowered before sunset.

Do you know this?

- Our national flag was initially manufactured at **Garaga**, a small village in Dharwad district. Now Karnataka Khadi Gramodyoga Samyukta Sangha, based in Hubballi is the only licensed manufacturer of the national flag and is the supply unit for India.

ನಮ್ಮ ಬಾವುಟ	**Namma Baavuta**
ಏರುತಿಹುದು ಹಾರುತಿಹುದು	Erutihudu Harutihudu
ನೋಡು ನಮ್ಮ ಬಾವುಟ	Nodu namma baavuta
ತೋರುತಿಹುದು ಹೊಡೆದು	Thorutihudu hodedu
ಹೊಡೆದು ಬಾನಿನಗಲ ಪಟಪಟ	hodedu baaninagala patapata
ಕೇಸರಿ ಬಿಳಿ ಹಸಿರು ಮೂರು	Kesari bili hasiru mooru
ಬಣ್ಣ ನಡುವೆ ಚಕ್ರವು	Banna naduve chakravu
ಸತ್ಯಶಾಂತಿ ತ್ಯಾಗಮೂರ್ತಿ	Satyashanti tyagamurthy
ಗಾಂಧಿ ಹಿಡಿದ ಚರಕವು	Gandhi hidida charakavu
ಇಂತ ಧ್ವಜವು ನಮ್ಮ ಧ್ವಜವು	Intha dwajavu namma dwajavu
ನೋಡು ಹಾರುತಿರುವುದು	Nodu haarutiruvudu
ಧ್ವಜದ ಭಕ್ತಿ ನಮ್ಮ ಶಕ್ತಿ	Dwajada bhakti namma shakti
ನಾಡಗುಡಿಯ ಮೆರೆವುದು	Naadagudiya merevudu
ಕೆಂಪುಕಿರಣ ತುಂಬಿ ಗಗನ	Kempukirana tumbi gagana
ಹೊನ್ನಬಣ್ಣವಾಗಿದೆ	Honnabannavaagide
ನಮ್ಮನಾಡ ಗುಡಿಯನೋಡ	Nammanaada gudiyanoda
ನೋಡಿರಣ್ಣ ಹೇಗಿದೆ.	Nodiranna hegide.
–ಕಯ್ಯಾರ ಕಿಞ್ಞಣ್ಣರೈ	**(Sing this poem in group)**

Meaning : The poem speaks about the splendour of our national flag and the essence of its grandeur. It depicts the truth, peace and sacrifice of great leaders like Gandhiji. It inculcates a sense of devotion in its patrons and gives strength to build our nation stronger.

Look here! This is the picture of a monolith pillar at Saranath. The lion seal that you notice here has been adopted as the National Emblem of India. This pillar was installed during the reign of Ashoka the Great, in North India.

The four facing lion imprint is our National Emblem. You can observe this national emblem on the coins and currency notes. Our emblems are the symbols of identity and heritage of India. You sing the National Anthem during the school assembly. Is it not so? Who has written it? Understand the theme of our national anthem. It represents the diversity and regionalism of India. While you are singing this national anthem, you feel patriotic.

Do you know this?

The National Anthem of India is taken from the first few stanzas of the poem written by Rabindranatha Tagore.

Observe :

- When the Indian sports persons win medals at the international sports competition they are honoured by being wrapped with the National Flag and the National Anthem is sung.
- In the 2016 Olympic games the badminton player P.V.Sindhu won the silver medal and wrestling player Sakshi Malik won the bronze medal. On that occasion they were honoured by the hoisting of the National Flag.
- When the Indian soldiers sacrifice their life for the nation, they are buried with full state honours.

Know this

The National Flag, National Emblem, and National Anthem are our National symbols.

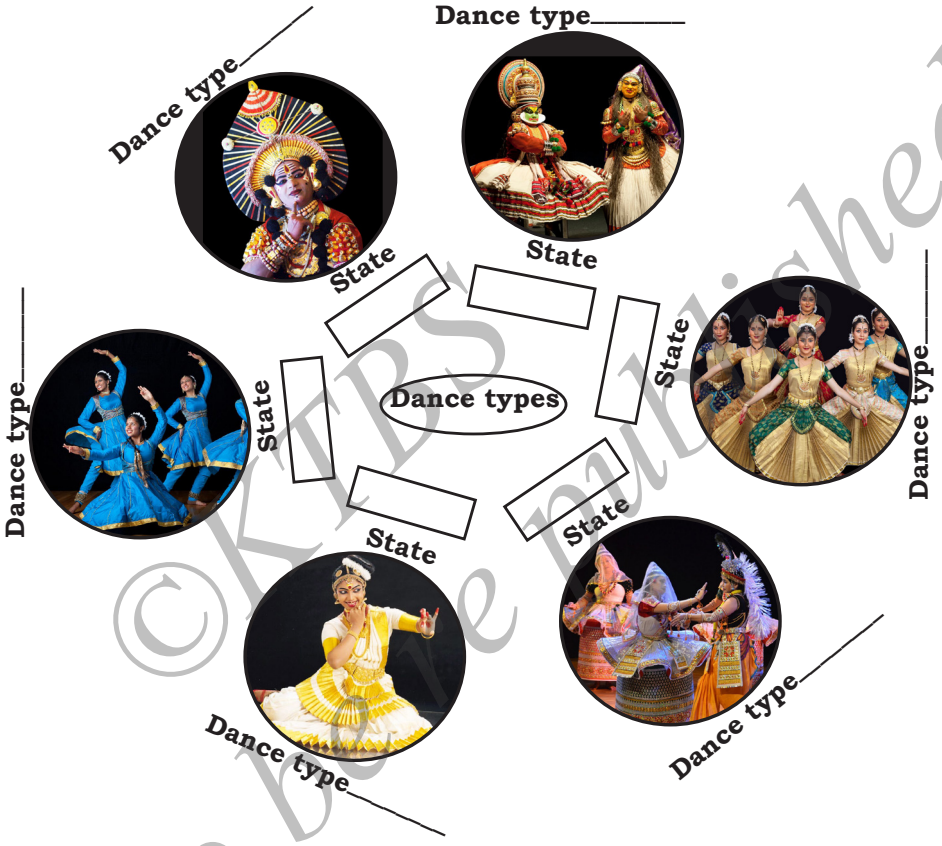
Activity : Paste a photo of **Rabindranatha Tagore** in the space provided

- With the help of your teacher learn how to fold the national flag and tie a knot of the thread before hoisting.
- You should practice singing the National Anthem in correct rhythm within the specified time (52 seconds).

5. Art, Music and Literature

Who does not like dancing? Every body likes it. Is it not so? Culture and art differs from place to place. Every state is identified by its own dance style. It is based on the culture of that locality. Dance styles can help in spreading the glory of India's heritage in foreign countries.

With the help of your teacher complete the following activity



Are not the postures, expressions of dance, costume designs, ornaments, proficiency, facial expressions, gestures etc., very distinctive? In India, there are different types of dances. You can also practice them. Among the many dance forms in Karnataka, **Yakshagana** has been selected as an important one.

Project work

- Prepare an Album regarding different types of dances or folklore art (Take the help of your teacher/parents).

Activity

Name this dance type and colour with suitable colours.

Name: _____

- Mention the popular folklore dance/art around your place.

_____

_____

_____

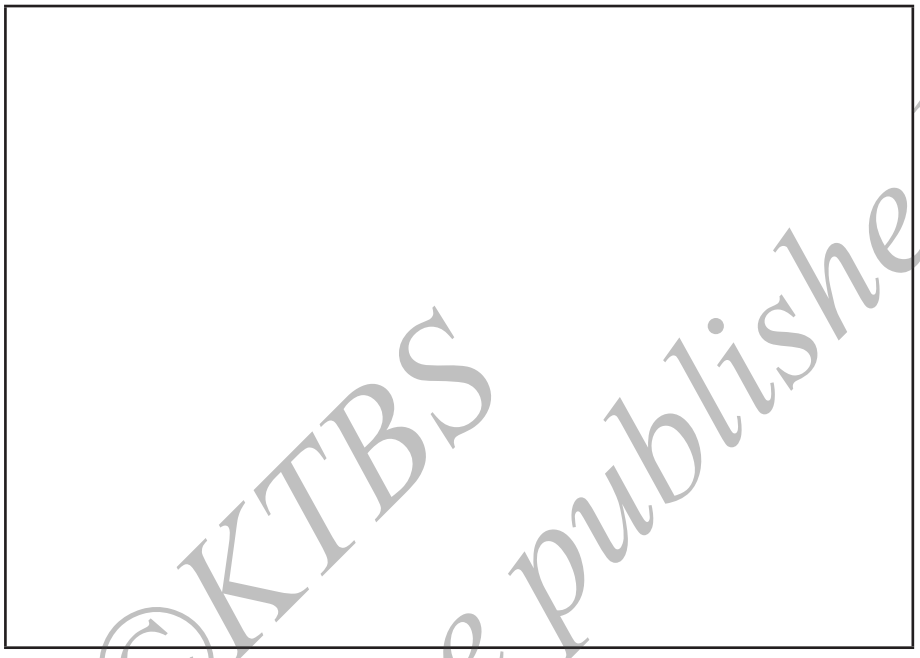
- Mention the name of any 3 famous folklore sports in Karnataka state.

_____

_____

_____

- Collect a photo of a famous dancer of India and paste it in the space provided. Write 3 sentences about him/her.



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Music and Literature

India is rich with litterateurs, great artist achievers, saints and monks and social reformers. Every state contributes its own music, literature, art, sports, cinema, science and technology. The Government of India rewards great personalities, by awarding **Padmashree**, **Padmabhushana**, **Padmavibhushana** and **Bharath Ratna** to acknowledge their achievement in their concerned field.

Activity : **Write the names of two recipients of the following awards. (Take the help of your teacher/ parents)**

1.	**Padmashree**	_____ _____
2.	**Padmabhushana**	_____ _____
3.	**Padmavibhushana**	_____ _____
4.	**Bharath Ratna**	_____ _____

- Who is this? Write 3 sentences about her.

_____

_____

_____

Write 5 sentences about any one popular litterateur/sports person/poet/writer/dancer/stage artist from your locality.

_____

_____

_____

_____

_____

Wherever we are, however we are, we should cultivate patriotism. We should all come together in the name of our motherland when needed. India has become an independent country because of its integrity, nonviolence and sacrifice. Let us develop India and make it a strong nation at the global level. It is the responsibility of every Indian to make India a strong nation.

Mera Desh Mahan