SOCIAL SCIENCE

(GEOGRAPHY)

Part-02

OUR ENVIRONMENT

Class 7



2021-2022

State Council of Educational Research and Training Chhattisgarh, Raipur

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Preface

It is clearly stated in the Nation at Education Policy that it is important to (i) over come time quality (ii) ensure that everyone gets education as per the national needs (iii) improve the quality of education (iv) give due importance to arts science and technology. Keeping in view these fundamental aspects, educationists have prepared a syllabus in public interest for all fields of education. The syllabus is to be implemented in all states to that the coming generations get similar education. Thus all students will facing competition will be coming with similar educational background. They will develop positive attitude towards the state and their educational dreams will be fulfilled.

In this context, NCERT has laid out common learning outcomes for elementary education; so Chhattisgarh has adopted their social science textbooks of classes 6 to 8 named Geography part-2.The government of Chhattisgarh has put in effect these textbooks for classes 6-8.

Unity in diversity has been the tradition of our county. To keep up this tradition and to be at par with other countries it is has been the intention since long to have similar syllabus for all states and to use the NCERT textbooks in all states. Conducting a common medical entrance text in 2018 was also an effort in this direction.The admission process for all technical courses is likely to be planned in a similar manner. Most competitive examination after class - 12 are conducted by CBSE and questions are asked from NCERT textbooks. Hence it is necessary to use similar learning materials for all national level examinations.

Chhattisgarh state has adopted the NCERT textbooks (English and Hindi medium). The lay-out design and printing of these books has been done by the Chhattisgarh State Textbook Corporation. The NCERT books adopted by Chhattisgarh state will be useful for the present and future generations. We are grateful to the Director NCERT for permitting and guiding us to adopt the NCERT textbooks for Chhattisgarh state.

We sincerely hope and believe that this textbook will be of great utility for the students. Since there in always scope for improvement, the State Council of Educational Research and Training always welcomes comments and suggestions from students, parents, teachers and educationists. Thus our humble efforts will be helpful in securing a high position for our state in the field of education in our country.

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MEMBER–COORDINATOR

Tannu Malik, *Lecturer*, Department of Education in Social Sciences and Humanities, NCERT, New Delhi

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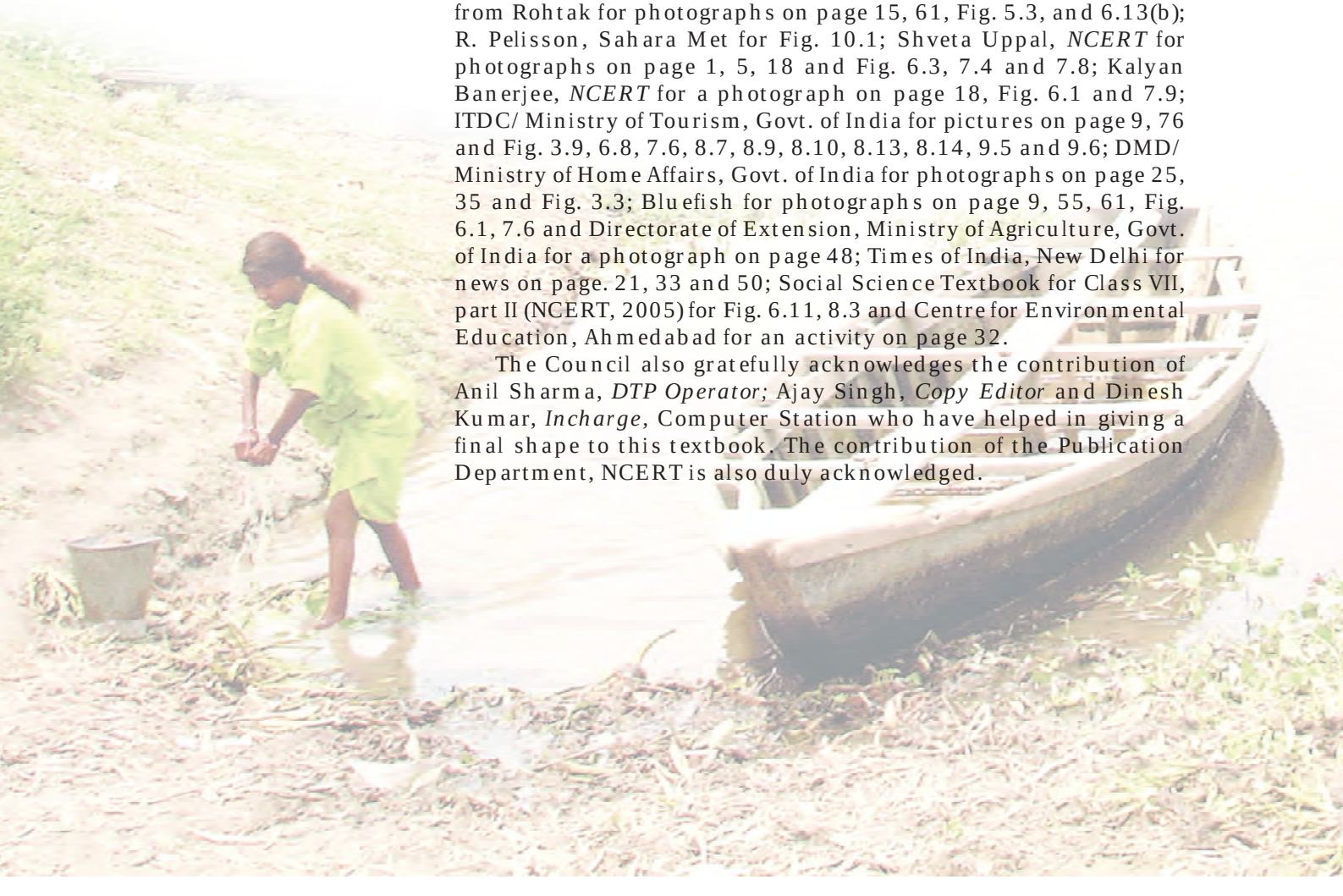
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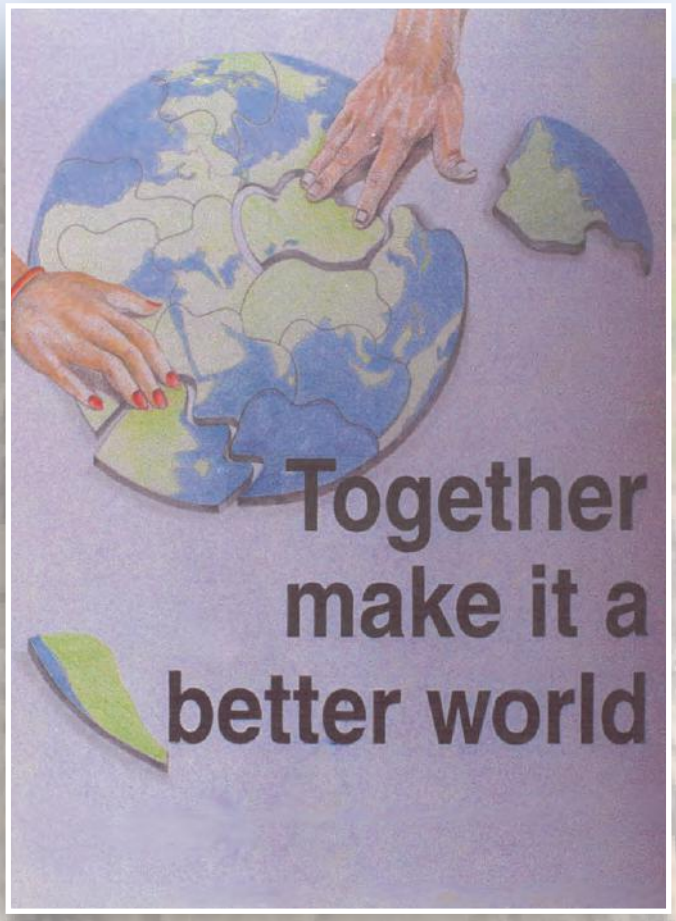
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The following are applicable to all the maps of India used in this textbook

1. © Government of India, Copyright 2006
2. The responsibility for the correctness of internal details rests with the publisher.
3. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.
4. The administrative headquarters of Chandigarh, Haryana and Punjab are at Chandigarh.
5. The interstate boundaries amongst Arunachal Pradesh, Assam and Meghalaya shown on this map are as interpreted from the "North-Eastern Areas (Reorganisation) Act.1971," but have yet to be verified.
6. The external boundaries and coastlines of India agree with the Record/ Master Copy certified by Survey of India.
7. The state boundaries between Uttaranchal & Uttar Pradesh, Bihar & Jharkhand and Chhattisgarh & Madhya Pradesh have not been verified by the Governments concerned.
8. The spellings of names in this map, have been taken from various sources.



Nirmalya Chakraborty, College of Art, New Delhi

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1 Environment

0762CH01

After the long vacation, when Ravi started going to school again, he noticed that the only playground next to his school was dug up. People said that a huge building with many flats will be constructed there. Ravi was almost in tears, when he realised that the big playground with its soft grass, marigolds and butterflies is gone for ever. He shared his feelings with his classmates. In the assembly, the Principal too sadly observed, "See how our environment is changing."

In the class Ravi asked his teacher, "What is environment?" "Whatever you see in your surroundings," said the teacher.

Ravi thought aloud, "That means, the school building, tables, chairs in the classroom, even that open field, the road, the garbage, my friends – all are parts of our environment"!

"Yes" said the teacher, "but wait... .. Some objects are created by nature – for example, mountains, rivers, trees, animals. Others are made by people – for example roads, cars, clothes, books".

Now work in pairs. Make a list with your classmate sitting next to you, of the creations of nature and by human beings.



Ravi, Paramjeet, Jessy, Mustafa, Asha were all excited about making the list. "Why is our environment changing?" asked Iqbal. "It's all because of our needs. They are



Environment is our basic life support system. It provides the air we breath, the water we drink, the food we eat and the land where we live.

How do human beings modify this natural environment? The car fumes pollute the air, water is collected in a pot, food is served in vessels and land is used to build factories.

Human beings make cars, mills, factories and manufacture containers. This is how human beings modify natural environment.

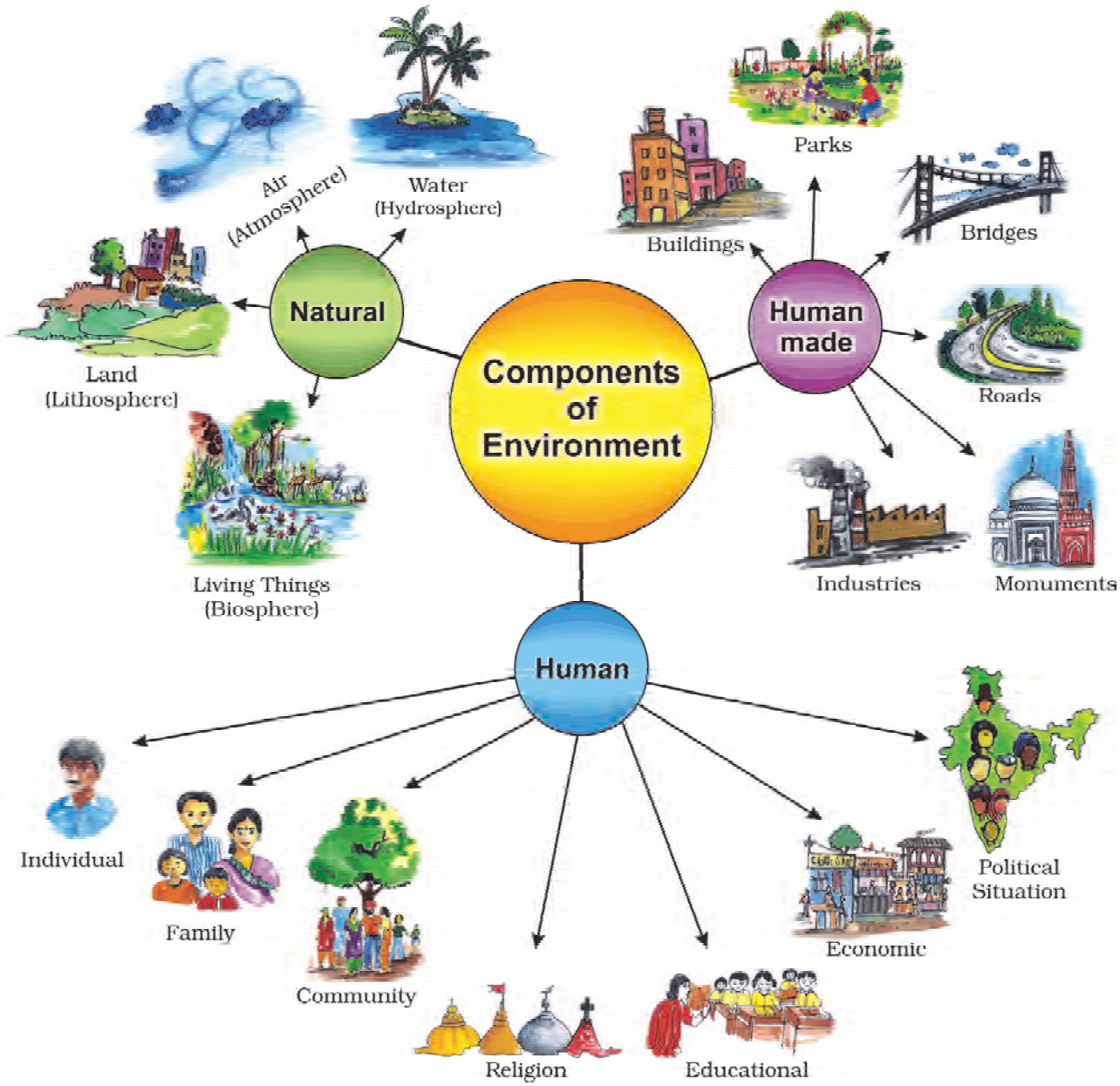


Fig. 1.1: Components of Environment

increasing day by day; we are therefore modifying and at times even destroying our natural surroundings", the teacher replied.

Biotic
The world of living organisms. e.g. plants and animals.

Abiotic
The world of non-living elements. e.g. land.

From the above conversation you understand that the place, people, things and nature that surround any living organism is called environment. It is a combination of natural and human made phenomena. While the natural environment refers to both biotic and abiotic conditions existing on the earth,

human environment reveals the activities, creations and interactions among human beings.

Natural Environment

Land, water, air, plants and animals comprise the natural environment. You are familiar with the meaning of lithosphere, hydrosphere, atmosphere and biosphere from your previous class. Let us learn some more facts about these domains.

Lithosphere is the solid crust or the hard top layer of the earth. It is made up of rocks and minerals and covered by a thin layer of soil. It is an irregular surface with various landforms such as mountains, plateaus, plains, valleys, etc. Landforms are found over the continents and also on the ocean floors.

Lithosphere is the domain that provides us forests, grasslands for grazing, land for agriculture and human settlements. It is also a source of mineral wealth.



Fig. 1.2: Domains of the Environment

The domain of water is referred to as hydrosphere. It comprises various sources of water and different types of water bodies like rivers, lakes, seas, oceans, etc. It is essential for all living organisms.

The atmosphere is the thin layer of air that surrounds the earth. The gravitational force of the earth holds the atmosphere around it. It protects us

Word Origin

Environment: French word *Environer/ Environner* meaning "neighbourhood".

Let's do

Look at your surroundings. Make a list of uses that the land in your neighbourhood is being put to.

Let's do

Where does the water you use in your home and school come from? Make a list of different uses of water in our daily life. Have you seen anyone wasting water? How?

Let's do

Observe the sky while coming to school. Make a note whether the day is cloudy, rainy, sunny, foggy etc.

Glossary

Ecosystem: It is a system formed by the interaction of all living organisms with each other and with the physical and chemical factors of the environment in which they live, all linked by transfer of energy and material.

Let's do

Sketch or bring photographs of your place like the students in the story.

from the harmful rays and scorching heat of the sun. It consists of a number of gases, dust and water vapour. The changes in the atmosphere produce changes in the weather and climate.

Plant and animal kingdom together make biosphere or the living world. It is a narrow zone of the earth where land, water and air interact with each other to support life.

What is ecosystem?

At an NCC camp that Ravi's class was attending, Jessy exclaimed, "What a heavy downpour. It reminds me of my home in Kerala. You should come and see how it pours and pours and pours over the lush green fields and coconut plantations."

Heera from Jaisalmer exclaimed, "We get no rains. We see only 'kikar' and sand, as far as the eyes can see." "But you also find camels", said Ravi.

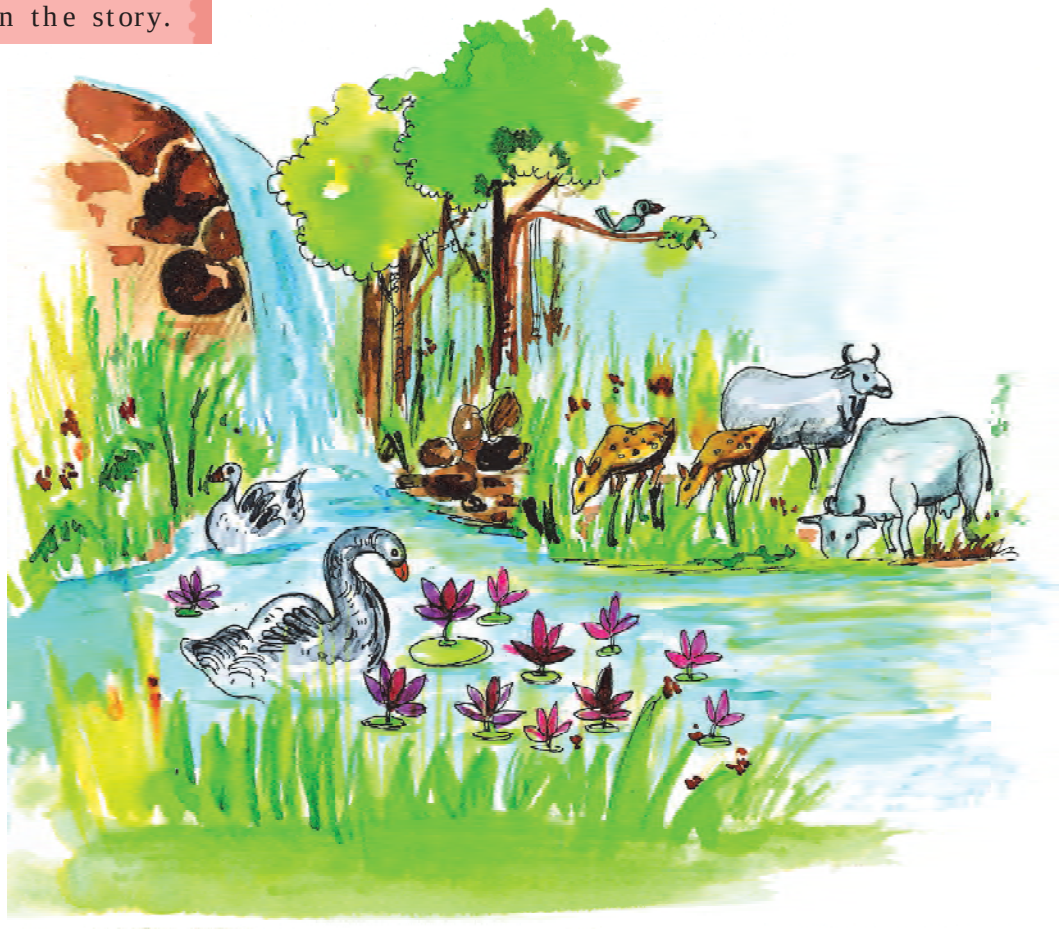


Fig. 1.3: A Pond Ecosystem

Heera says, "Not just camels. If you visit our desert, you will see snakes, lizards and many insects too."

Ravi wondered, "Why do the animals, the vegetation and the way people live vary from place to place? Are they all related to each other?"

"Oh yes, very much so", the teacher replied.

All plants, animals and human beings depend on their immediate surroundings. Often they are also interdependent on each other. This relation between the living organisms, as well as the relation between the organisms and their surroundings form an ecosystem. There could be an ecosystem of large rain forest, grassland, desert, mountains, lake, river, ocean and even a small pond.

Do you think the park in which Ravi and his friends played formed an ecosystem?

Human Environment

Human beings interact with the environment and modify it according to their need. Early humans adapted themselves to the natural surroundings. They led a simple life and fulfilled their requirements from the nature around them. With time needs grew and became more varied. Humans learn new ways to use and change environment. They learn to grow crops, domesticate animals and lead a settled life. The wheel was invented, surplus food was produced, barter system emerged, trade started and commerce developed. Industrial revolution enabled large scale production. Transportation became faster. Information revolution made communication easier and speedy across the world.

Have you ever thought why you love eating a juicy watermelon in summer and hot roasted peanuts in winter? A perfect balance is necessary between the natural and human environment. Humans must learn to live and use their environment in a harmonious way.

Nurie, a girl from Mizoram from Ravi's class often talks about the lush green surroundings of her place. Seeing Ravi upset at having lost his playground, Nurie invited him to visit her home state during the coming vacation. Ravi's teacher asked the students to draw the landscape, houses and activities of the people and places they visit during the holidays.



On 5 June every year the World Environment Day is celebrated.



Barter System:
It is a trade in which goods are exchanged without the use of money.





Talk to some elderly person in your neighbourhood and collect information about–

- The trees in his/ her neighbourhood when he/ she was your age.
- The indoor games he/ she played.
- His/ her favourite fruit at your age.
- How did they make themselves comfortable during hot summers and cold winters?

Display your answers on a wall/ bulletin board.



1. Answer the following questions.

(i) What is an ecosystem?

(ii) What do you mean by natural environment?

(iii) Which are the major components of the environment?

(iv) Give four examples of human made environment.

(v) What is lithosphere?

(vi) Which are the two major components of biotic environment?

(vii) What is biosphere?

2. Tick the correct answer.

(i) Which is not a natural ecosystem?

(a) Desert (b) Aquarium (c) Forest

(ii) Which is not a component of human environment?

(a) Land (b) Religion (c) Community

(iii) Which is a human made environment?

(a) Mountain (b) Sea (c) Road

(iv) Which is a threat to environment?

(a) Growing plant

(b) Growing population

(c) Growing crops

3. Match the following.

(i) Biosphere	(a) blanket of air which surrounds the earth
(ii) Atmosphere	(b) domain of water
(iii) Hydrosphere	(c) gravitational force of the earth
(iv) Environment	(d) our surroundings
	(e) narrow zone where land water and air interact
	(f) relation between the organisms and their surroundings

4. Give reasons.

(i) Man modifies his environment

(ii) Plants and animals depend on each other

5. Activity.

Imagine an ideal environment where you would love to live. Draw the picture of your ideal environment.



2 Inside Our Earth

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The earth, our homeland is a dynamic planet. It is constantly undergoing changes inside and outside. Have you ever wondered what lies in the interior of the earth? What is the earth made up of?

Interior of the Earth

Just like an onion, the earth is made up of several concentric layers with one inside another (Fig. 2.1). The uppermost layer over the earth's surface is called the crust. It is the thinnest of all the layers. It is about 35 km. on the continental masses and only 5 km. on the ocean floors.

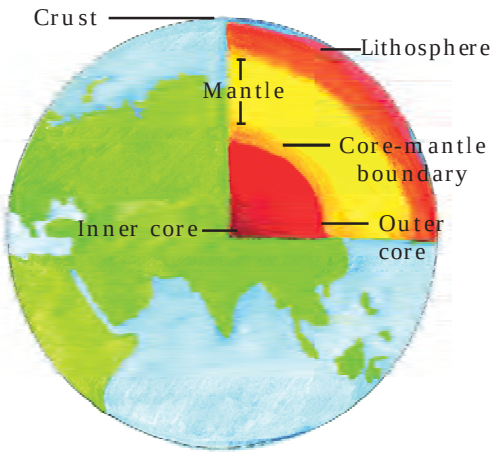


Fig. 2.1: Interior of the Earth

The main mineral constituents of the continental mass are silica and alumina. It is thus called sial *(si*-silica and *al*-alumina*)*. The oceanic crust mainly consists of silica and magnesium; it is therefore called sima (*si*-silica and *ma*-magnesium) (Fig. 2.2).

Just beneath the crust is the mantle which extends up to a depth of 2900 km. below the crust.

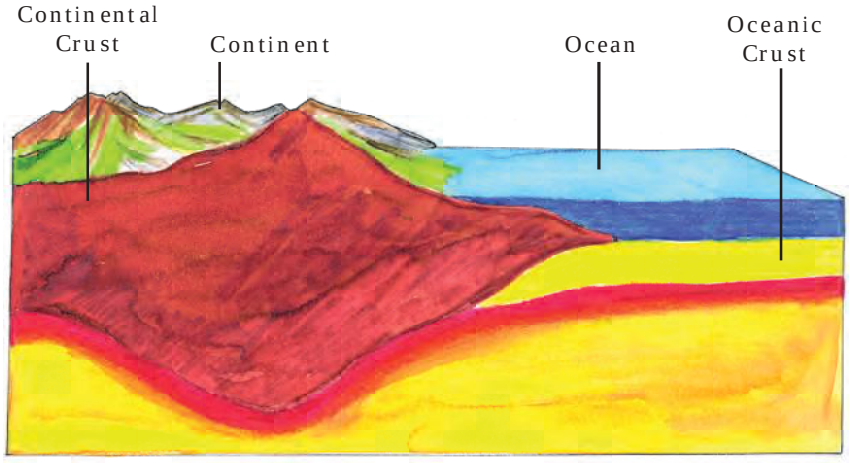


Fig. 2.2: Continental Crust and Oceanic Crust

Do you know?

- The deepest mine in the world, is in South Africa. It is about 4 km. deep. In search for oil engineers have dug a hole about 6 km. deep.
- To reach to the centre of the earth (which is not possible!) you will have to dig a hole 6000 km. deep on the ocean floor.

Do you know?

- The crust forms only 1 per cent of the volume of the earth, 84 per cent consists of the mantle and 15 per cent makes the core.
- The radius of the earth is 6371 km.

Word Origin

Igneous: Latin word *Ignis* meaning fire.

Sedimentary: Latin word *sedimentum* meaning settle down.

Metamorphic: Greek word *metamorphose* meaning change of form.

Glossary

Fossils: The remains of the dead plants and animals trapped in the layers of rocks are called fossils.

The innermost layer is the core with a radius of about 3500 km. It is mainly made up of nickel and iron and is called nife (*ni* – nickel and *fe* – ferrous i.e. iron). The central core has very high temperature and pressure.

Rocks and Minerals

The earth's crust is made up of various types of rocks. Any natural mass of mineral matter that makes up the earth's crust is called a rock. Rocks can be of different colour, size and texture.

There are three major types of rocks: igneous rocks, sedimentary rocks and metamorphic rocks.

When the molten magma cools, it becomes solid. Rocks thus formed are called igneous rocks. They are also called primary rocks. There are two types of igneous rocks: intrusive rocks and extrusive rocks.

Can you imagine lava coming out from the volcanoes? Lava is actually fiery red molten magma coming out from the interior of the earth on its surface. When this molten lava comes on the earth's surface, it rapidly cools down and becomes solid. Rocks formed in such a way on the crust are called extrusive igneous rocks. They have a very fine grained structure. For example, basalt. The Deccan plateau is made up of basalt rocks. Sometimes the molten magma cools down deep inside the earth's crust. Solid rocks so formed are called intrusive igneous rocks. Since they cool down slowly they form large grains. Granite is an example of such a rock. Grinding stones used to prepare paste/ powder of spices and grains are made of granite.

Rocks roll down, crack, and hit each other and are broken down into small fragments. These smaller particles are called sediments. These sediments are transported and deposited by wind, water, etc. These loose sediments are compressed and hardened to form layers of rocks. These types of rocks are called sedimentary rocks. For example, sandstone is made from grains of sand. These rocks may also contain fossils of plants, animals and other micro-organisms that once lived on them.



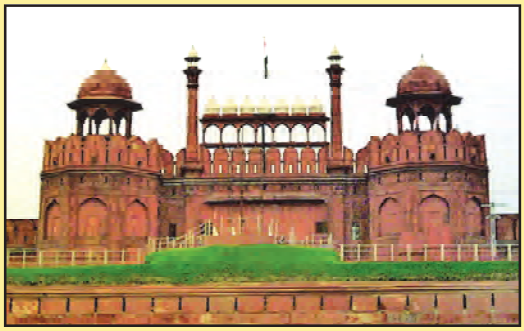
Fig. 2.3: Sedimentary rock turned into a Metamorphic rock

Igneous and sedimentary rocks can change into metamorphic rocks under great heat and pressure (Fig. 2.3). For example, clay changes into slate and limestone into marble.

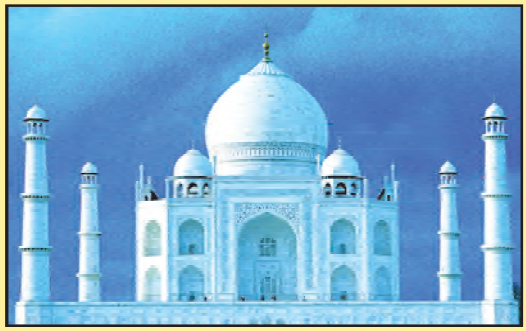
Rocks are very useful to us. The hard rocks are used for making roads, houses and buildings. You use stones in many games. For example, seven stones (*pitthoo*), hop-scotch (*stapu/ kit kit*), five stones (*gitti*). Find out some more such games by asking your grand parents, parents, neighbours, etc.



Collect pictures of some monuments and find out which are the rocks used to build them. Two pictures have been collected for you.



The Red Fort is made of red sandstone



The Taj Mahal is made of white marble

You will be surprised to know that one type of rock changes to another type under certain conditions in a cyclic manner. This process of transformation of the rock from one to another is known as the rock cycle. You have already learnt when the molten magma cools; it solidifies to become igneous rock. These igneous rocks are broken down into small particles that are transported and deposited to form sedimentary rocks. When the igneous and sedimentary rocks are subjected to heat and pressure they change into metamorphic rocks. The metamorphic rocks which are still under great heat and pressure melt down to form molten magma. This molten magma again can cool down and solidify into igneous rocks (Fig. 2.4).

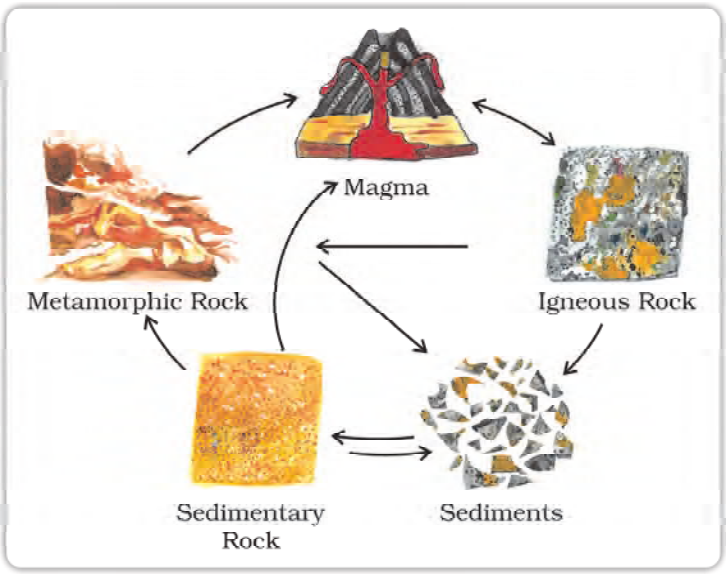


Fig. 2.4: Rock Cycle



What are the minerals found in your state?

Collect some samples to show in your class.

Rocks are made up of different minerals. Minerals are naturally occurring substances which have certain physical properties and definite chemical composition. Minerals are very important to humankind. Some are used as fuels. For example, coal, natural gas and petroleum. They are also used in industries – iron, aluminium, gold, uranium, etc, in medicine, in fertilisers, etc.



1. Answer the following questions.
   (i) What are the three layers of the earth?
   (ii) What is a rock?
   (iii) Name three types of rocks.
   (iv) How are extrusive and intrusive rocks formed?
   (v) What do you mean by a rock cycle?
   (vi) What are the uses of rocks?
   (vii) What are metamorphic rocks?

2. Tick the correct answer.
   (i) The rock which is made up of molten magma is
   (a) Igneous (b) Sedimentary (c) Metamorphic
   (ii) The innermost layer of the earth is
   (a) Crust (b) Core (c) Mantle
   (iii) Gold, petroleum and coal are examples of
   (a) Rocks (b) Minerals (c) Fossils
   (iv) Rocks which contain fossils are
   (a) Sedimentary rocks
   (b) Metamorphic rocks
   (c) Igneous rocks
   (v) The thinnest layer of the earth is
   (a) Crust (b) Mantle (c) Core

3. Match the following.

(i) Core	(a) Earth's surface
(ii) Minerals	(b) Used for roads and buildings
(iii) Rocks	(c) Made of silicon and alumina
(iv) Clay	(d) Has definite chemical composition
(v) Sial	(e) Innermost layer
	(f) Changes into slate
	(g) Process of transformation of the rock

4. Give reasons.

(i) We cannot go to the centre of the earth.

(ii) Sedimentary rocks are formed from sediments.

(iii) Limestone is changed into marble.

5. For fun.

(i) What are the minerals most commonly used in the following objects?

(ii) Identify some more objects made up of different minerals.





3 Our Changing Earth

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Activity

Take a small coloured paper pellet and put it in a beaker half filled with water. Place the beaker on a tripod stand and heat it. As the water warms up, you will observe that the paper pellet is moving upward along with the warm layers of water and then sinks back along with the cooler layers of water. The molten magma inside the earth moves in a similar manner.





Glossary

Lithospheric plates: The earth's crust consists of several large and some small, rigid, irregularly-shaped plates (slabs) which carry continents and the ocean floor.

The lithosphere is broken into a number of plates known as the Lithospheric plates. You will be surprised to know that these plates move around very slowly – just a few millimetres each year. This is because of the movement of the molten magma inside the earth. The molten magma inside the earth moves in a circular manner as shown in the activity.

The movement of these plates causes changes on the surface of the earth. The earth movements are divided on the basis of the forces which cause them. The forces which act in the interior of the earth are called as Endogenic forces and the forces that work on the surface of the earth are called as Exogenic forces (Fig. 3.1).

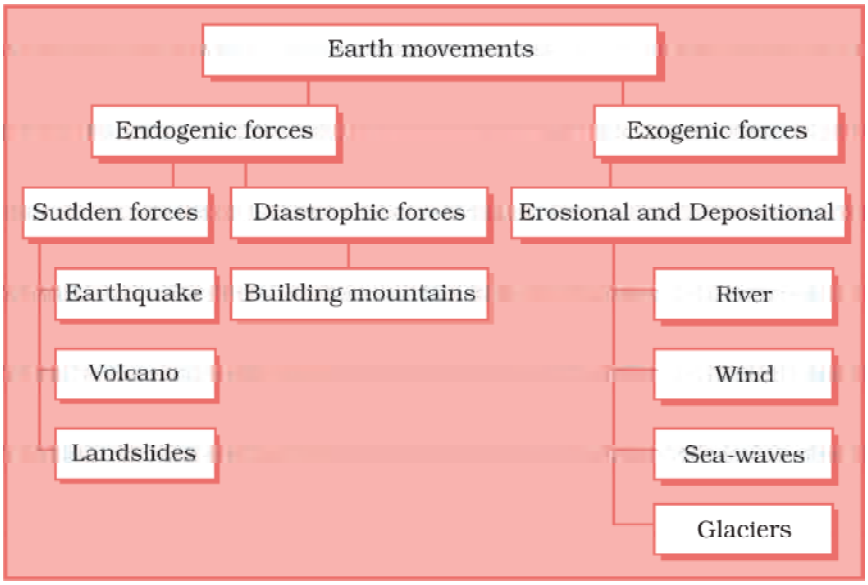


Fig. 3.1: Evolution of Landforms

Endogenic forces sometimes produce sudden movements and at the other times produce slow movements. Sudden movements like earthquakes and volcanoes cause mass destruction over the surface of the earth.

A volcano is a vent (opening) in the earth's crust through which molten material erupts suddenly (Fig. 3.2).

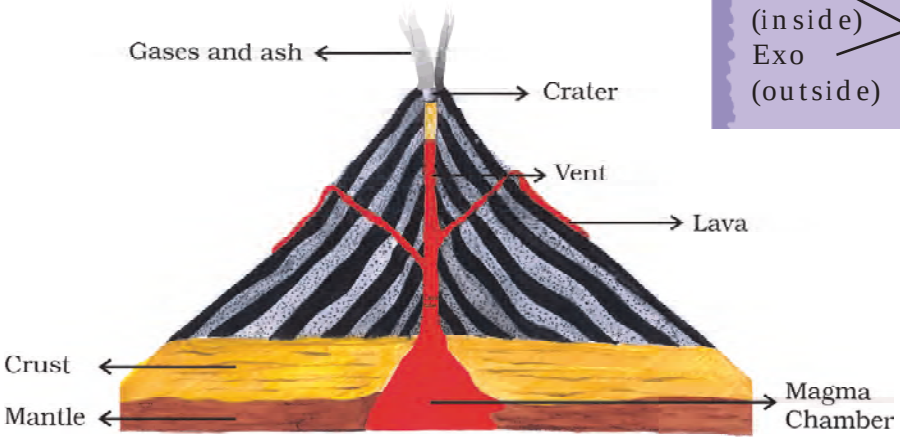


Fig. 3.2: A Volcano

Similarly, when the Lithospheric plates move, the surface of the earth vibrates. The vibrations can travel all round the earth. These vibrations are called earthquakes (Fig. 3.3). The place in the crust where the movement starts is called the focus. The place on the surface above the focus is called the epicentre. Vibrations travel outwards from the epicentre as waves. Greatest damage is usually closest to the epicentre and the strength of the earthquake decreases away from the centre.

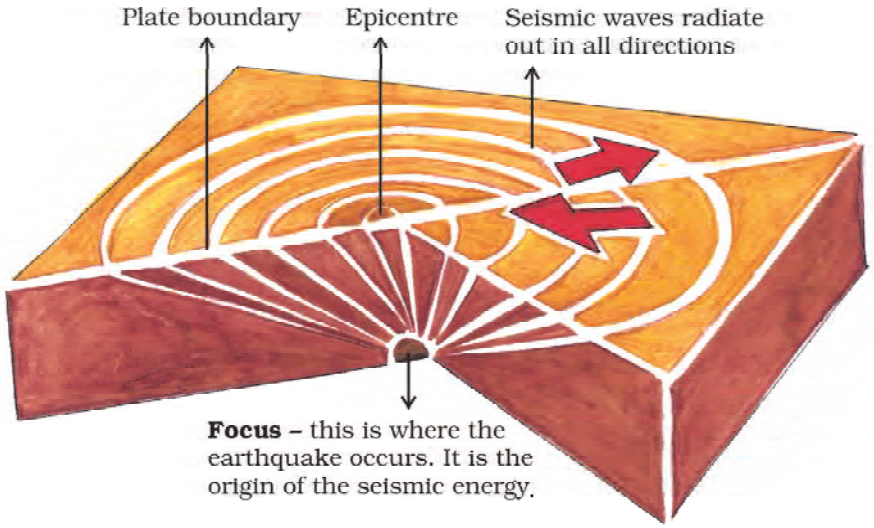


Fig. 3.3: Origin of an Earthquake

Word Origin

Endo (inside) + genic (origin) → Endogenic
Exo (outside) + genic (origin) → Exogenic

Activity

Take a container, fill it with water and close it with a lid. Put the water to boil. Now put some peas, spoon and beads on top on the lid. What do you notice? As the water boils the lid begins to shake. The things which you have put on the lid also vibrate. The beads roll down and the spoon vibrates to make a sound. In the same manner, the earth vibrates when an earthquake occurs.

Do you know?

There are three types of earthquake waves:
1. P waves or longitudinal waves
2. S waves or transverse waves
3. L waves or surface waves

Try to find out the properties of these waves from an encyclopedia.



Fig. 3.3a: Destruction caused by an Earthquake in Gujarat

Although earthquakes cannot be predicted, the impact can certainly be minimised if we are prepared before-hand.

Some common earthquake prediction methods adopted locally by people include studying animal behaviour; fish in the ponds get agitated, snakes come to the surface.

Earthquake – A Case Study

1 EARTHQUAKE HITS BHUJ

A massive earthquake measuring 6.9 on Richter scale hit Bhuj Town on 26th January 2001.

2 School worst affected

Atleast 971 students and 31 teachers are feared to have lost their lives following the collapse of school buildings.

3 BHUJ RELIEF EFFORT BLIGHTED..

Three days after the quake, concern rose about food, blankets and medical supplies not reaching everyone.

4 Destruction of Bhuj

Phone lines, water pipelines and power stations transmission lines were knocked out.

5 Fire in the city

Hundreds of fires started as charcoal, cookers overturned.

6 Emergency declared in quake zone

The President declares a state of emergency.

7 CM'S APPEAL TO THE CENTRE

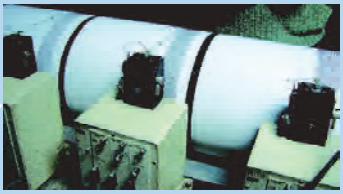
Gujarat appeals for financial help. The Chief Minister of Gujarat has launched an appeal for the Centre to deal with the disaster.

Activity

1. Read the 'Earthquake – A case study' given in the form of headlines that appeared in the newspapers after the quake. Arrange the events in the right sequence of their happening.
2. Imagine if a quake suddenly shook in the middle of the school day, where would you go for safety?

Do you know?

An earthquake is measured with a machine called a seismograph. The magnitude of the earthquake is measured on the Richter scale. An earthquake of 2.0 or less can be felt only a little. An earthquake over 5.0 can cause damage from things falling. A 6.0 or higher magnitude is considered very strong and 7.0 is classified as a major earthquake.



A Seismograph

Earthquake Preparedness

Where to take shelter during an earthquake –

Safe Spot – Under a kitchen counter, table or desk, against an inside corner or wall.

Stay Away from – Fire places, areas around chimneys, windows that shatter including mirrors and picture frames.

Be Prepared – Spread awareness amongst your friends and family members and face any disaster confidently.

Major Land Forms

The landscape is being continuously worn away by two processes – weathering and erosion. Weathering is the breaking up of the rocks on the earth's surface. Erosion is the wearing away of the landscape by different agents like water, wind and ice. The eroded material is carried away or transported by water, wind, etc. and eventually deposited. This process of erosion and deposition create different landforms on the surface of the earth.

Work of a River

The running water in the river erodes the landscape. When the river tumbles at steep angle over very hard rocks or down a steep valley side it forms a waterfall (Fig. 3.4).

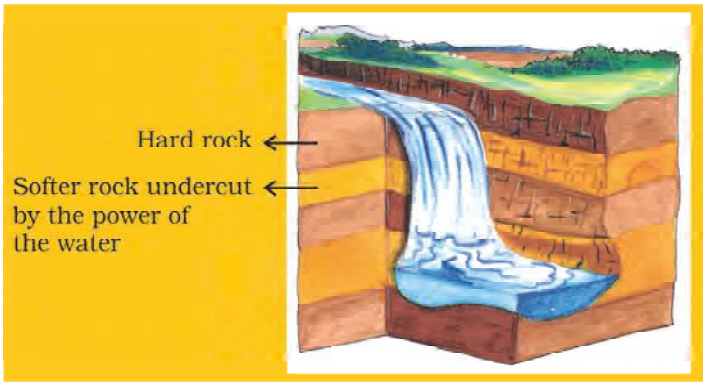


Fig. 3.4: Waterfall

Do you know?

- There are thousands of small waterfalls in the world. The highest waterfall is Angel Falls of Venezuela in South America. The other waterfalls are Niagara falls located on the border between Canada and USA in North America and Victoria Falls on the borders of Zambia and Zimbabwe in Africa.



The Niagra falls

As the river enters the plain it twists and turns forming large bends known as meanders. Due to continuous erosion and deposition along the sides of the meander, the ends of the meander loop come closer and closer. In due course of time the meander loop cuts off from the river and forms a cut-off lake, also called an ox-bow lake. At times the river overflows its banks. This leads to the flooding of the neighbouring areas. As it floods, it deposits layers of fine soil and other material called sediments along its banks. This leads to the formation of a flat fertile floodplain. The raised banks are called levees. As the river approaches the sea, the speed of the flowing water decreases and the

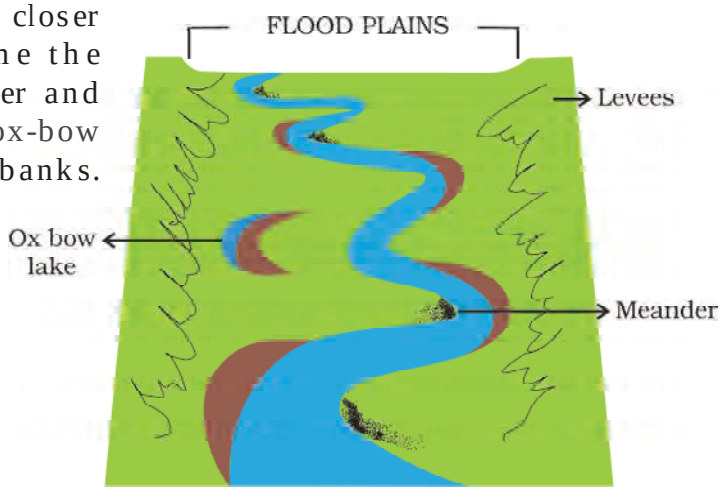


Fig. 3.5: Features made by a river in a flood plain



Find out the names of a few rivers of the world that form a delta.

river begins to break up into a number of streams called distributaries. The river becomes so slow that it begins to deposit its load. Each distributary forms its own mouth. The collection of sediments from all the mouths forms a delta.

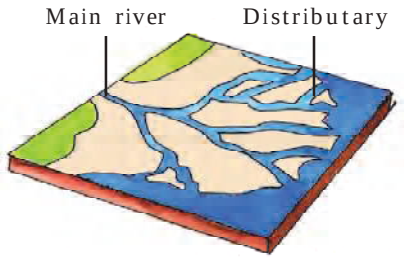


Fig. 3.6: A Delta

Work of Sea Waves

The erosion and deposition of the sea waves gives rise to coastal landforms. Seawaves continuously strike at the rocks. Cracks develop. Over time they become larger and wider. Thus, hollow like caves are formed on the rocks. They are called sea caves. As these cavities become bigger and bigger only the roof of the caves remain, thus forming sea arches. Further, erosion breaks the roof and only walls are left. These wall like features are called stacks. The steep rocky coast rising almost vertically above sea water is called sea cliff. The sea waves deposit sediments along the shores forming beaches.

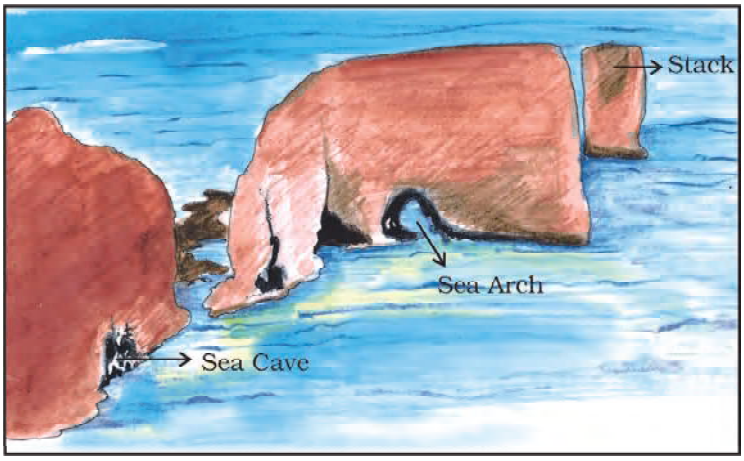


Fig. 3.7: Features made by sea waves

Work of Ice

Glaciers are "rivers of ice" which too erode the landscape by bulldozing soil and stones to expose the solid rock below. Glaciers carve out deep hollows there. As the ice melts they get filled up with water and become beautiful lakes in the mountains. The material carried by the glacier such as rocks big and small, sand and silt gets deposited. These deposits form glacial moraines.



Fig. 3.8: A Glacier



Fig. 3.9: Sand Dunes

Work of wind

Have you ever visited a desert? Try to collect some pictures of sand dunes.

An active agent of erosion and deposition in the deserts is wind. In deserts you can see rocks in the shape of a mushroom, commonly called mushroom rocks. Winds erode the lower section of the rock more than the upper part. Therefore, such rocks have narrower base and wider top. When the wind blows, it lifts and transports sand from one place to another. When it stops blowing the sand falls and gets deposited in low hill –like structures. These are called sand dunes (Fig. 3.9). When the grains of sand are very fine and light, the wind can carry it over very long distances. When such sand is deposited in large areas, it is called loess. Large deposits of loess is found in China.



1. Answer the following questions.
   (i) Why do the plates move?
   (ii) What are exogenic and endogenic forces?
   (iii) What is erosion?
   (iv) How are flood plains formed?
   (v) What are sand dunes?
   (vi) How are beaches formed?
   (vii) What are ox bow lakes?

2. Tick the correct answer.
   (i) Which is not an erosional feature of sea waves?
   (a) Cliff (b) Beach (c) Sea cave
   (ii) The depositional feature of a glacier is:
   (a) Flood plain (b) Beach (c) Moraine
   (iii) Which is caused by the sudden movements of the earth?
   (a) Volcano (b) Folding (c) Flood plain
   (iv) Mushroom rocks are found in:
   (a) Deserts (b) River valleys (c) Glaciers
   (v) Ox bow lakes are found in:
   (a) Glaciers (b) River valleys (c) Deserts

3. Match the following.

(i) Glacier	(a) Sea shore
(ii) Meanders	(b) Mushroom rock
(iii) Beach	(c) River of ice
(iv) Sand dunes	(d) Rivers
(v) Waterfall	(e) Vibrations of earth
(vi) Earthquake	(f) Sea cliff
	(g) Hard bed rock
	(h) Deserts

4. Give reasons.

(i) Some rocks have a shape of a mushroom.

(ii) Flood plains are very fertile.

(iii) Sea caves are turned into stacks.

(iv) Buildings collapse due to earthquakes.

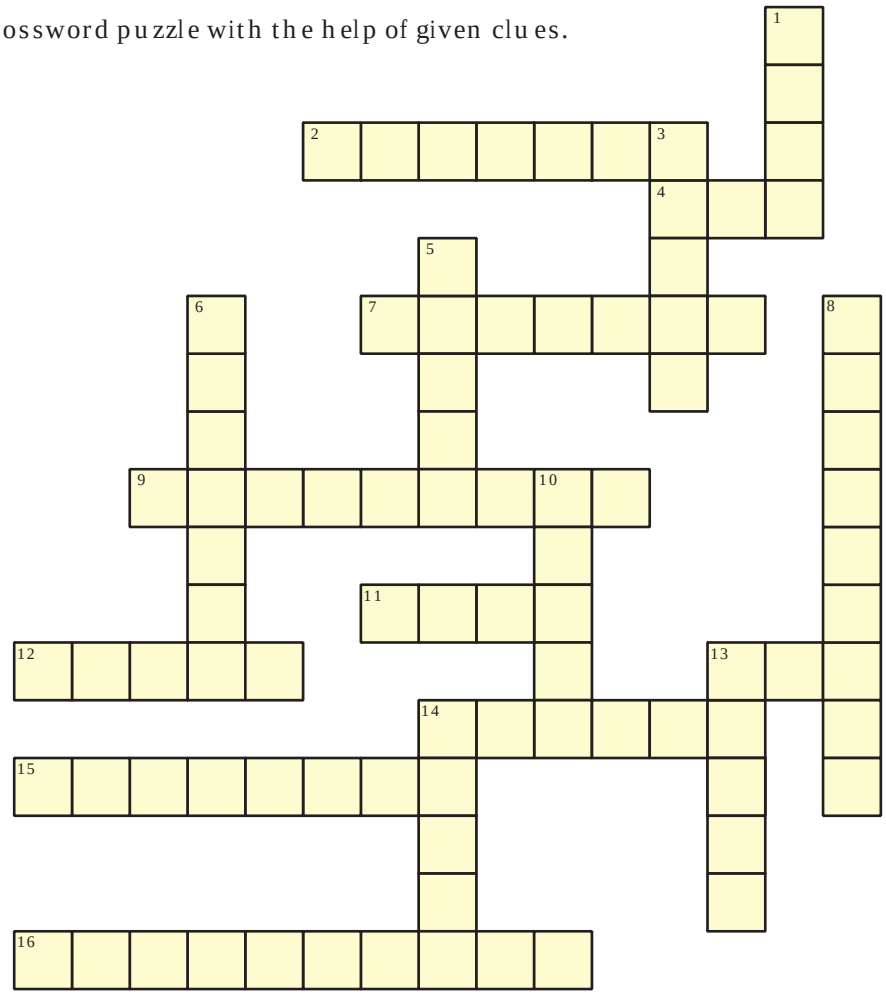
5. Activity.

Observe the photographs given below. These are various features made by a river. Identify them and also tell whether they are erosional or depositional or landforms formed by both.

Photograph	Name of the Feature	Type (Erosional or Depositional or Both)
		
		
		

6. For fun.

Solve the crossword puzzle with the help of given clues.



Across

2. Loop like the bend of a river
4. Solid form of water
7. Moving mass of ice
9. Sudden descent of water in the bed of a river
11. Natural cavity on weak rocks formed by action of waves
12. Embankment on a river that keeps it in its channel
13. Large body of sea water
14. Dry area where sand dunes are found
15. Small hill of sand caused by the action of the wind
16. Flat plain formed by river deposits during time of flood

Down

1. Rise and fall of water caused by friction of wind on water surface
3. Flow of water in a channel
5. Steep perpendicular face of a rock along a sea coast
6. Debris of boulder and coarse material carried by glacier
8. Crescent shaped lake formed by a meandering river
10. Fine sand deposited by the action of the wind
13. Isolated mass of rising steep rock near a coastline
14. Alluvial tracts of land formed by the river deposits at the mouth of a river

4 Air

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Do you know?

Carbon dioxide released in the atmosphere creates a green house effect by trapping the heat radiated from the earth. It is therefore called a greenhouse gas and without it the earth would have been too cold to live in. However, when its level in the atmosphere increases due to factory smoke or car fumes, the heat retained increases the temperature of the earth. This is called global warming. This rise in temperature causes the snow in coldest parts of the world to melt. As a result the sea level rises, causing floods in the coastal areas. There may be drastic changes in the climate of a place leading to extinction of some plants and animals in the long run.

Our earth is surrounded by a huge blanket of air called atmosphere. All living beings on this earth depend on the atmosphere for their survival. It provides us the air we breathe and protects us from the harmful effects of the sun's rays. Without this blanket of protection, we would be baked alive by the heat of the sun during day and get frozen during night. So it is this mass of air that has made the temperature on the earth liveable.

Composition of the Atmosphere

Do you know that the air we take in while breathing is actually a mixture of many gases? Nitrogen and oxygen are two gases which make up the bulk of the atmosphere. Carbon dioxide, helium, ozone, argon and hydrogen are found in lesser quantities. Apart from these gases, tiny dust particles are also present in the air. The pie chart gives you the percentage of different constituents of air (Fig. 4.1). Nitrogen is the most plentiful gas in the air. When we inhale, we take some amount of nitrogen into our lungs and exhale it. But plants need nitrogen for their survival. They can not take

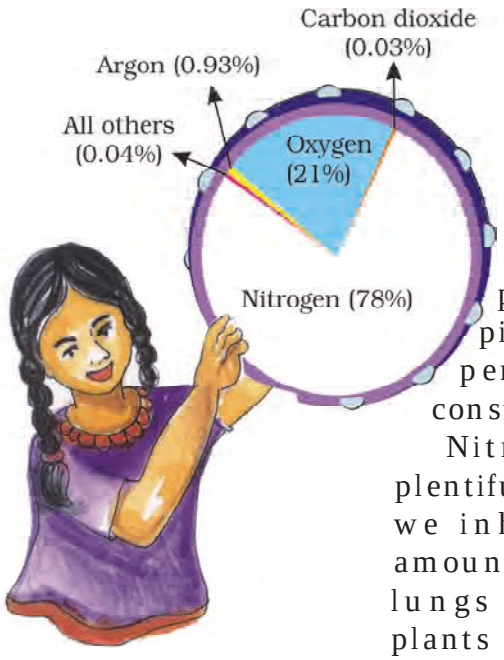
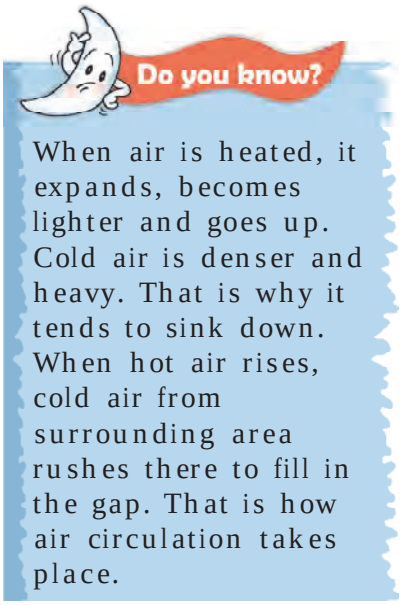


Fig. 4.1: Constituents of Air

nitrogen directly from the air. Bacteria, that live in the soil and roots of some plants, take nitrogen from the air and change its form so that plants can use it.

Oxygen is the second most plentiful gas in the air. Humans and animals take oxygen from the air as they breathe. Green plants produce oxygen during photosynthesis. In this way oxygen content in the air remains constant. If we cut trees then this balance gets disturbed.

Carbon dioxide is another important gas. Green plants use carbon dioxide to make their food and release oxygen. Humans or animals release carbon dioxide. The amount of carbon dioxide released by humans or animals seems to be equal to the amount used by the plants which make a perfect balance. However, the balance is upset by burning of fuels, such as coal and oil. They add billions of tons of carbon dioxide into the atmosphere each year. As a result, the increased volume of carbon dioxide is affecting the earth's weather and climate.





Read and Ponder: Is global warming a serious issue in today's world?

Structure of the Atmosphere

Our atmosphere is divided into five layers starting from the earth's surface. These are Troposphere, Stratosphere, Mesosphere, Thermosphere and Exosphere (Fig. 4.2).

Troposphere: This layer is the most important layer of the atmosphere. Its average height is 13 km. The air we breathe exists here. Almost all the weather phenomena like rainfall, fog and hailstorm occur in this layer.

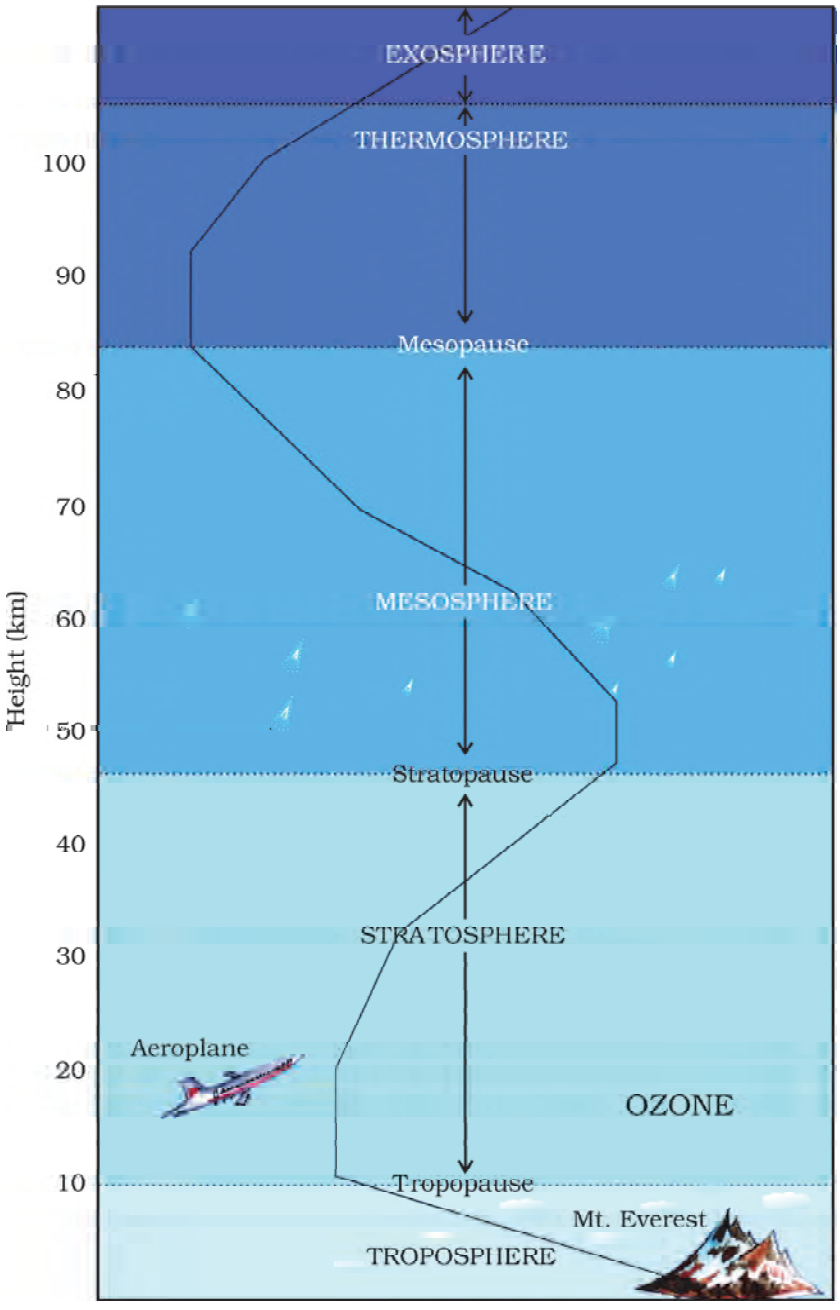


Fig. 4.2: Layers of the Atmosphere

Stratosphere: Above the troposphere lies the stratosphere. It extends up to a height of 50 km. This layer is almost free from clouds and associated weather phenomenon, making conditions most ideal for flying aeroplanes. One important feature of stratosphere is that it contains a layer of ozone gas. We have just learnt how it protects us from the harmful effect of the sun rays.

Mesosphere: This is the third layer of the atmosphere. It lies above the stratosphere. It extends up to the height of 80 km. Meteorites burn up in this layer on entering from the space.

Thermosphere: In thermosphere temperature rises very rapidly with increasing height. Ionosphere is a part of this layer. It extends between

80-400 km. This layer helps in radio transmission. In fact, radio waves transmitted from the earth are reflected back to the earth by this layer.

Exosphere: The upper most layer of the atmosphere is known as exosphere. This layer has very thin air. Light gases like helium and hydrogen float into the space from here.



Let's do

For ten days note down weather report from a local newspaper and observe the changes occurring in the weather.

Weather and Climate

"Is it going to rain today?" "Will it be bright and sunny today?" How many times have we heard this from anxious cricket fans speculating the fate of a One Day match? If we imagine our body to be a radio and the mind its speaker, weather is something that fiddles with its control knobs. Weather is this hour-to-hour, day to day condition of the atmosphere. A hot or humid weather may make one irritable. A pleasant, breezy weather may make one cheerful and even plan for an outing. Weather can change dramatically from day to day. However, the average weather condition of a place for a longer period of time represents the climate of a place. Now do you understand why we have daily weather forecasts.



Do you know?

You will be surprised to know that the earth receives only 1 in 2,000,000,000 parts of the sun's energy.

Temperature

The temperature you feel everyday is the temperataure of the atmosphere. The degree of hotness and coldness of the air is known as temperature.

The temperature of the atmosphere changes not only between day and night but also from season to season. Summers are hotter than winters.

An important factor that influences the distribution of temperature is *insolation*. *Insolation* is the incoming solar energy intercepted by the earth.

The amount of insolation decreases from the equator towards the poles. Therefore, the

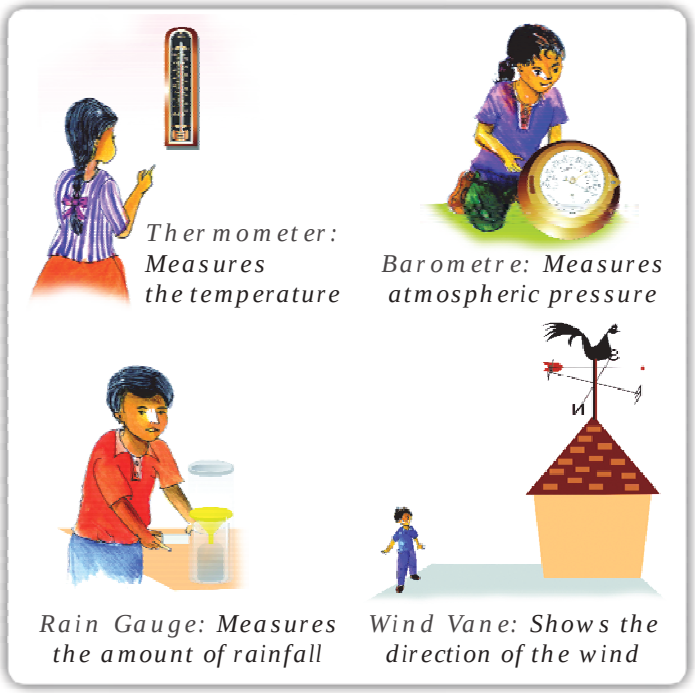


Fig. 4.3: Weather Instruments



The standard unit of measuring temperature is degree Celsius. It was invented by Anders Celsius. On the Celsius scale the water freezes at 0°C and boils at 100°C.

temperature decreases in the same manner. Now do you understand why poles are covered with snow? If the earth's temperature rises too high, it would become too warm for some crops to grow. Temperature in cities is much higher than that of villages. The concrete and metals in buildings and the asaphalt of roads get heated up during the day. This heat is released during the night.

Also, the crowded high rise buildings of the cities trap the warm air and thus raise the temperature of the cities.

Air Pressure



On the moon there is no air and hence no air pressure.

Astronauts have to wear special protective space suits filled with air when they go to the moon. If they did not wear these space suits, the counter pressure exerted by the body of the astronauts would make the blood vessels burst. The astronauts would bleed.

You will be surprised to know that air above us presses us with a great force on our bodies. However, we don't even feel it. This is because the air presses us from all directions and our body exerts a counter pressure.

Air pressure is defined as the pressure exerted by the weight of air on the earth's surface. As we go up the layers of atmosphere, the pressure falls rapidly. The air pressure is highest at sea level and decreases with height. Horizontally the distribution of air pressure is influenced by temperature of air at a given place. In areas where temperature is high the air gets heated and rises. This creates a low-pressure area. Low pressure is associated with cloudy skies and wet weather.

In areas having lower temperature, the air is cold. It is therefore heavy. Heavy air sinks and creates a high pressure area. High pressure is associated with clear and sunny skies.

The air always moves from high pressure areas to low pressure areas.

Wind



A wind is named after the direction *from* which it blows, e.g. the wind blowing *from* the west is called westerly.

The movement of air from high pressure area to low pressure areas is called wind. You can see wind at work as it blows dry leaves down the pavement or uproots trees during a storm. Sometimes when the wind blows gently you can even see it blowing away smoke or fine dust. At times wind can be so strong that it is difficult to walk against it. You must have experienced it is not easy to hold an umbrella on a windy day. Think of some other examples when strong winds have created

problems for you. Winds can be broadly divided into three types.

1. *Permanent winds* – The trade winds, westerlies and easterlies are the permanent winds. These blow constantly throughout the year in a particular direction.
2. *Seasonal winds* – These winds change their direction in different seasons. For example monsoons in India.
3. *Local winds* – These blow only during a particular period of the day or year in a small area. For example, land and sea breeze. Do you recall the hot and dry local wind of northern planes of India? It is called *loo*.

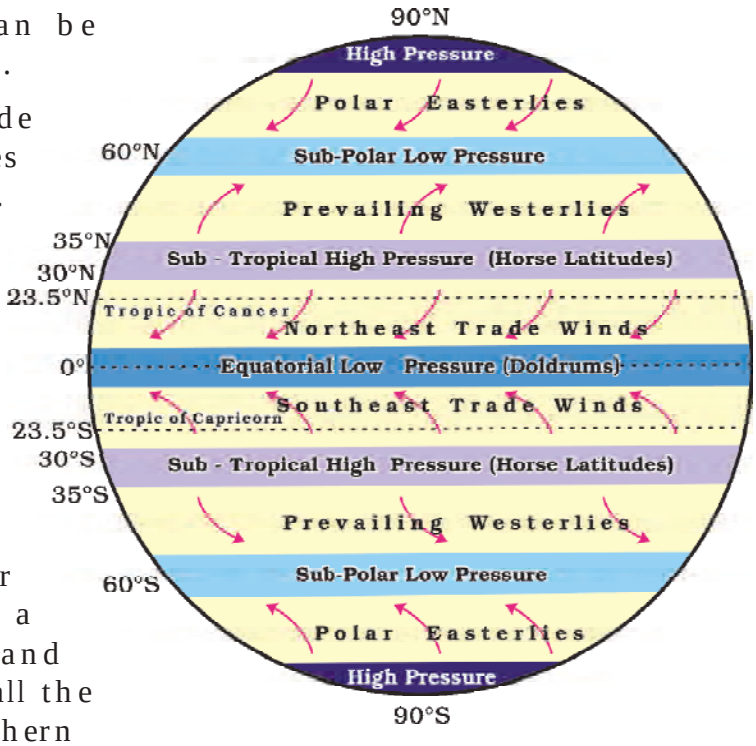


Fig. 4.4: Major Pressure Belts and Wind System

CYCLONE – NATURE'S FURY

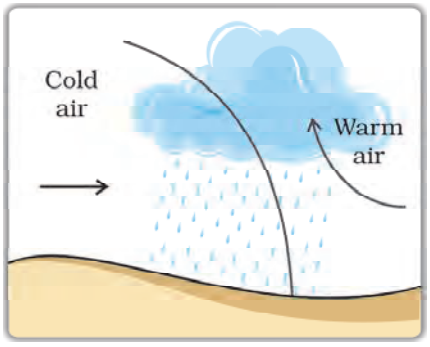


Destruction caused by a cyclone

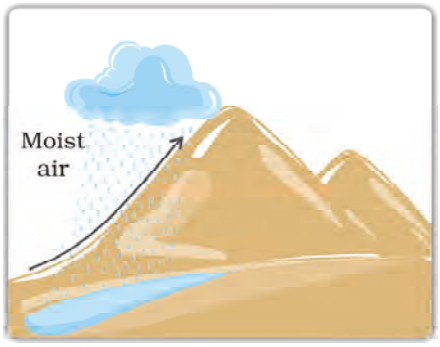
Odisha, located on the eastern seacoast of India is prone to cyclones that originate in the Bay of Bengal. On 17-18 October 1999, cyclone hit five districts of the state. Another supercyclone occurred on the 29 October 1999, that devastated large portions of the state. The damages caused were mainly due to three factors: wind velocity, rain and tidal surge. The winds of upto 260 km. per hour lasted for over 36 hours. These high velocity winds uprooted trees and damaged the *kutcha* houses. Roof tops of several industrial sheds and other houses were also blown away. Power supply and telecom lines snapped completely. Heavy rain occurred under the influence of the cyclone for three days continuously. These rains led to flooding in the major rivers of Odisha. The cyclonic winds caused tidal waves that swept 20 km. inland and brought massive destruction to the coastal areas. The 7 to 10 m high tidal wave intruded suddenly and caused massive damage to the standing paddy crops.

The cyclone originated as a "depression" in the Gulf of Thailand, near east of Port Blair, on 25 October 1999 and gradually moved in a northwestward direction. It intensified into a supercyclone and hit the area between Erasama and Balikuda in Odisha on 29 October at 10.30 a.m.

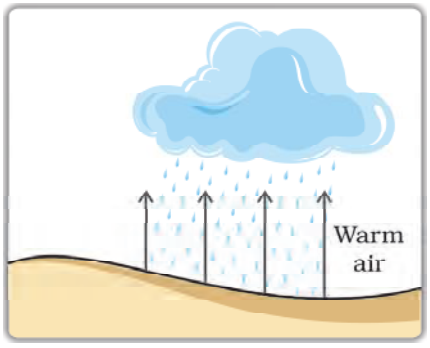
The supercyclone swept the entire coast of Odisha including the cities of Bhubaneshwar and Cuttack and 28 coastal towns. About 13 million people were affected. A large number of livestock were killed. Standing crops of paddy, vegetables and fruits were heavily damaged. Due to salinisation caused by tidal surge, large tracts of agricultural land have turned infertile. Large tracts of sal, teak and bamboo plantations have disappeared. The mangrove forests between Paradeep and Konark vanished.



Cyclonic Rainfall



Relief (Orographic) Rainfall



Convectional Rainfall

Fig. 4.5: Types of Rainfall

Moisture

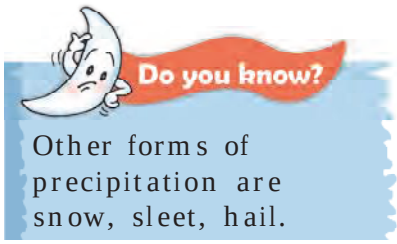
When water evaporates from land and different water bodies, it becomes water vapour. Moisture in the air at any time, is known as humidity. When the air is full of water vapour we call it a humid day. As the air gets warmer, its capacity to hold the water vapour increases and so it becomes more and more humid. On a humid day, clothes take longer to dry and sweat from our body does not evaporate easily, making us feel very uncomfortable.

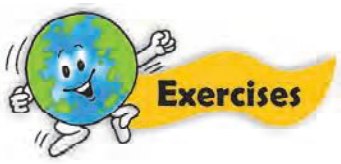
When the water vapour rises, it starts cooling. The water vapour condenses causing formation of droplets of water. Clouds are just masses of such water droplets. When these droplets of water become too heavy to float in air, then they come down as precipitation.

Jet planes flying in the sky leave a white trail behind them. The moisture from their engines condenses. We see trails of this condensed moisture for some time when there is no air movement to disturb it.

Precipitation that comes down to the earth in liquid form is called rain. Most of the ground water comes from rainwater. Plants help preserve water. When trees on hill sides are cut, rainwater flows down the bare mountains and can cause flooding of low lying areas. On the basis of mechanism, there are three types of rainfall: the convectional rainfall, the orographic rainfall and the cyclonic rainfall (Fig. 4.5).

Rainfall is very important for the survival of plants and animals. It brings fresh water to the earth's surface. If rainfall is less – water scacity and drought occur. On the other hand if it is more, floods take place.





1. Answer the following questions.
   (i) What is atmosphere?
   (ii) Which two gases make the bulk of the atmosphere?
   (iii) Which gas creates green house effect in the atmosphere?
   (iv) What is weather?
   (v) Name three types of rainfall?
   (vi) What is air pressure?

2. Tick the correct answer.
   (i) Which of the following gases protects us from harmful sun vays?
   (a) Carbon dioxide (b) Nitrogen (c) Ozone
   (ii) The most important layer of the atmosphere is
   (a) Troposphere (b) Thermosphere (c) Mesosphere
   (iii) Which of the following layers of the atmosphere is free from clouds?
   (a) Troposphere (b) Stratosphere (c) Mesosphere
   (iv) As we go up the layers of the atmosphere, the pressure
   (a) Increases (b) Decreases (c) Remains the same
   (v) When precipitation comes down to the earth in the liquid form, it is called
   (a) Cloud (b) Rain (c) Snow

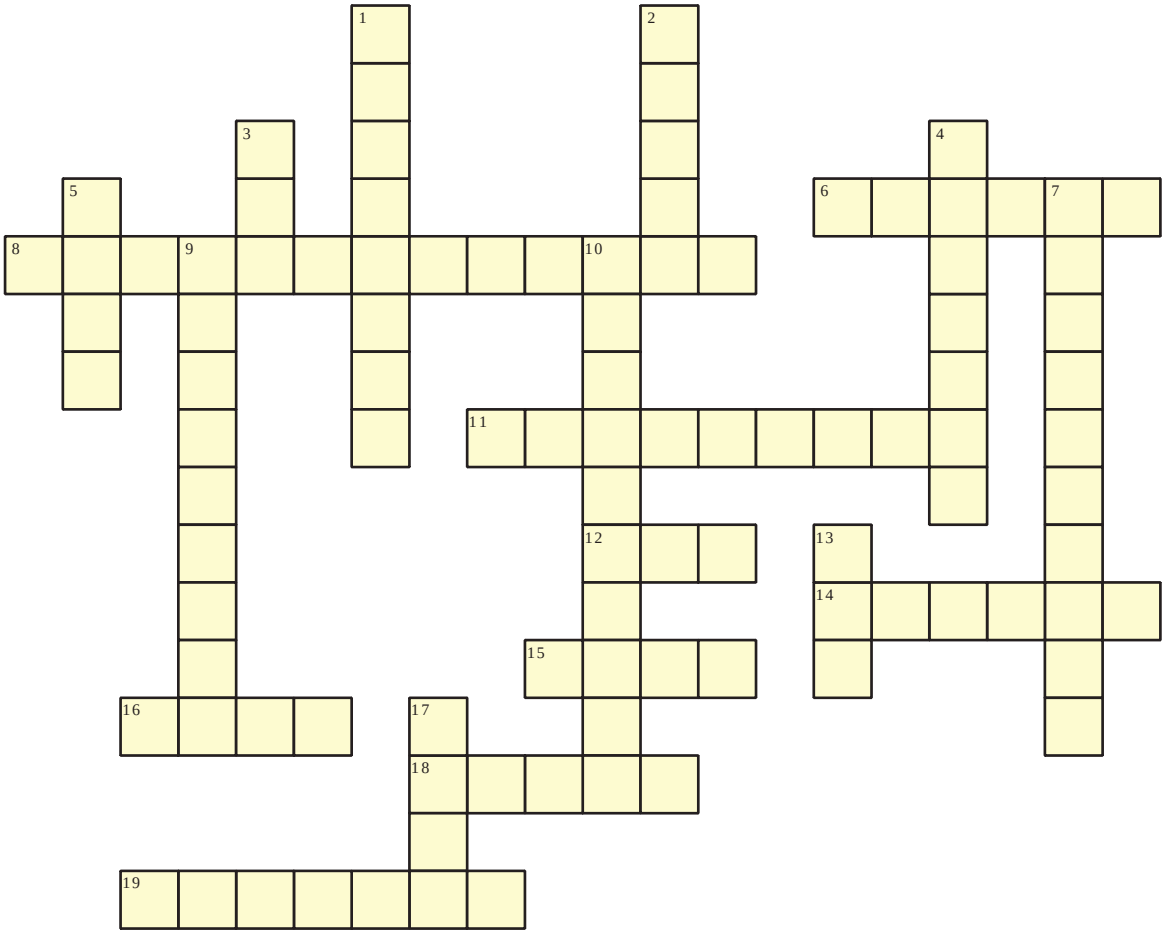
3. Match the following.

(i) Trade Winds	(a) Incoming solar energy
(ii) Loo	(b) Seasonal wind
(iii) Monsoon	(c) Horizontal movement of Air
(iv) Wind	(d) Layer of ozone gas
	(e) Permanent wind
	(f) Local wind

4. Give reasons.
   (i) Wet clothes take longer time to dry on a humid day?
   (ii) Amount of insolation decreases from equator towards poles?

5. For fun.

(i) Solve this Crossword puzzle with the help of given clues:



Across

6. An Indian tree having extraordinary quality of providing oxygen round the clock
8. Gas present in atmosphere occupying only 0.03% by volume
11. Outermost layer of atmosphere
12. Mixture of many gases
14. Life giving gas
15. Air in motion
16. An indian tree valued highly for medicinal properties
18. Gas protecting us from harmful sunrays
19. Low pressure area

Down

1. Amount of water vapour in air
2. Condensation of water vapours around dust particles in atmosphere
3. Example of local wind blowing in summer in northern india
4. Short term changes in atmosphere
5. Precipitation in liquid form
7. Blanket of air around the earth
9. Instrument to measure pressure
10. Incoming solar radiation
13. Reduces visibility in winters
17. It is ..... time when sun is overhead

(ii) Make a weather calendar for one week. Use pictures or symbols to show different types of weather. You can use more than one symbol in a day, if the weather changes. For example, the sun comes out when rain stops. An example is given below:

Day	Weather
1. 	Sunny day
2.	
3.	
4.	
5.	
6.	
7.	

5 Water

0762CH05

Glossary

Terrarium: It is an artificial enclosure for keeping small house plants.

Activity

Make your own Terrarium



A Terrarium

Fill one-fourth of a big jar with soil and press it well. Put a thin layer of humus on top of it. Plant the largest plants first and then arrange the smaller ones around them. Spray the arrangement with water and close the jar. The water that evaporates from the leaves and soil condenses and falls back in the form of drops of water.

When you think of water, what images come to your mind? You think of rivers, the waterfalls, the pitter patter of raindrops, water in your taps... Children love to float paper boats in rain puddles. By noon the puddles vanish. Where does the water go?

The sun's heat causes evaporation of water into vapour. When the water vapour cools down, it condenses and forms clouds. From there it may fall on the land or sea in the form of rain, snow or sleet.

The process by which water continually changes its form and circulates between oceans, atmosphere and land is known as the water cycle (Fig 5.1).

Our earth is like a terrarium. The same water that existed centuries ago still exists today. The water used to irrigate a field in Haryana may have flowed down the Amazon River a hundred years ago.

The major sources of fresh water are the rivers, ponds, springs and glaciers. The ocean bodies and the seas contain salty water. The water of the oceans is salty or saline as it contains large

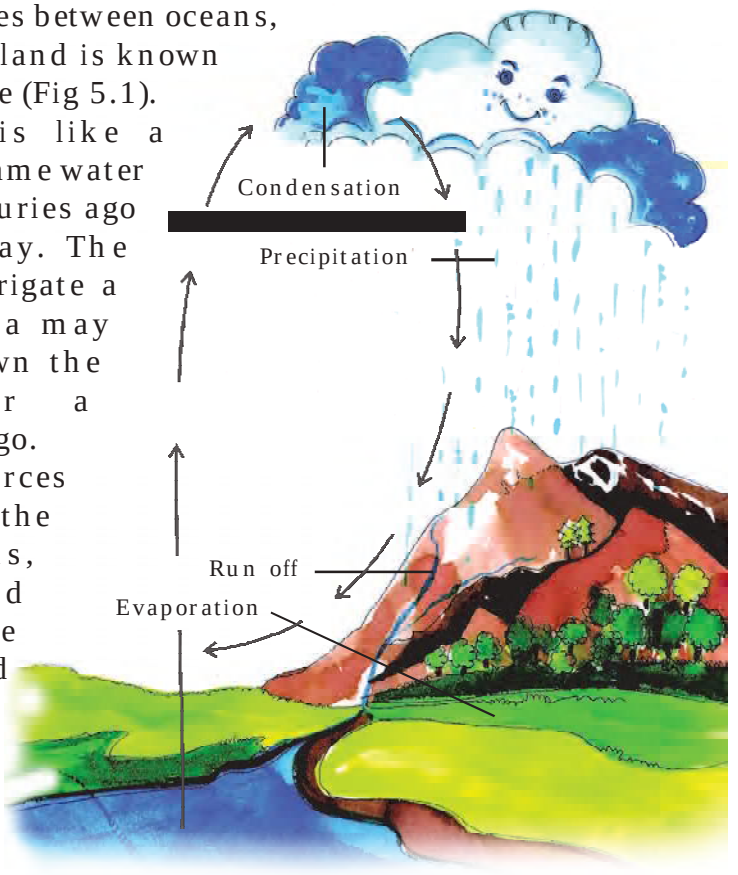


Fig. 5.1: Water Cycle

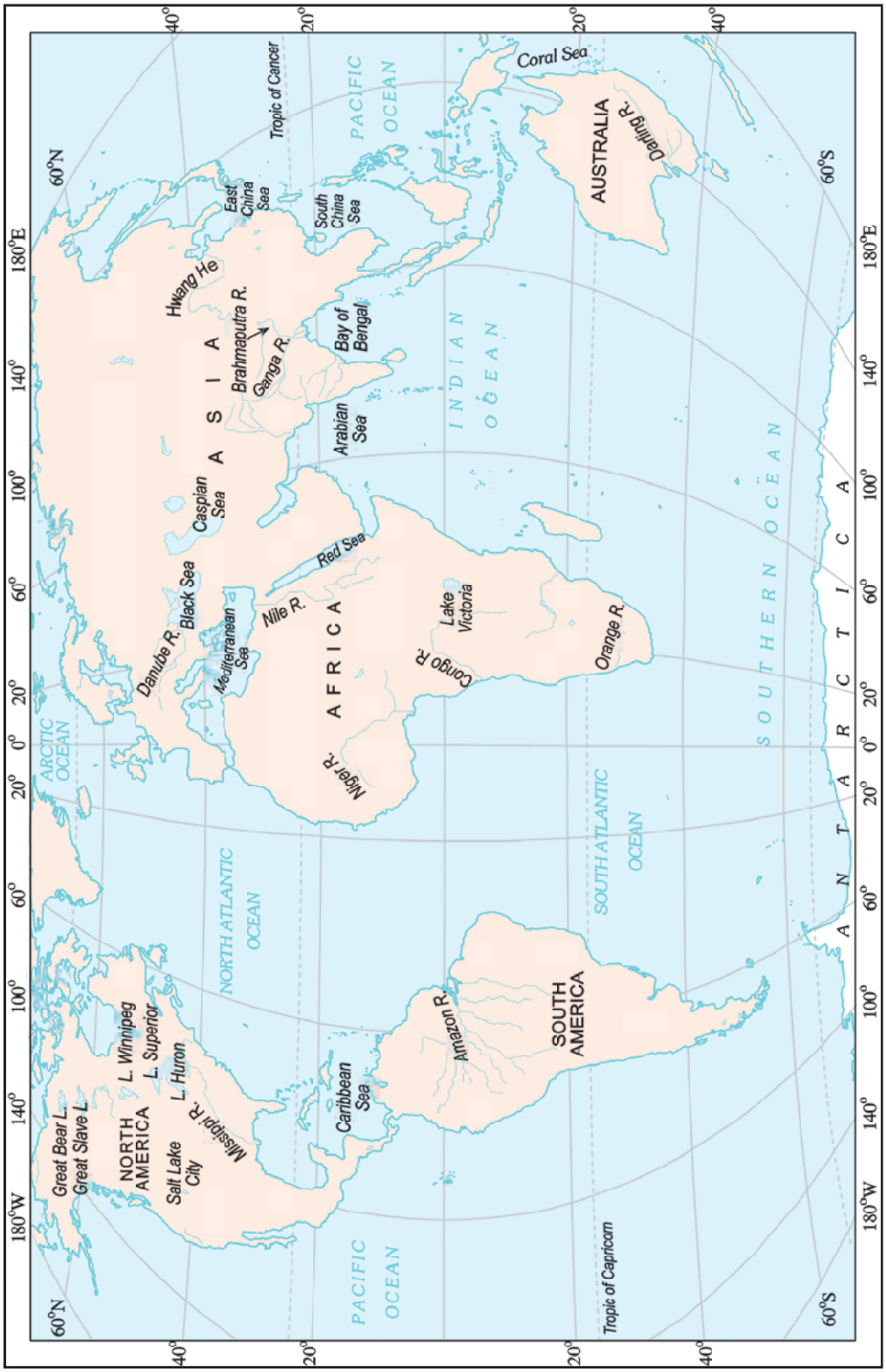


Fig. 5.2: World – Major Seas, Lakes and Rivers

amount of dissolved salts. Most of the salt is sodium chloride or the common table salt that you eat.

Do you know?

Salinity is the amount of salt in grams present in 1000 grams of water. The average salinity of the oceans is 35 parts per thousand.

Do you know?

Dead sea in Israel has salinity of 340 grams per litre of water. Swimmers can float in it because the increased salt content makes it dense.

Distribution of Water Bodies

We all know that three-fourth of the earth surface is covered by water. If there is more water than land on this earth, why do so many countries face water scarcity?

Is all the water on earth available to us? The following table gives the distribution of water in percentage.

Oceans	:	97.3	Saline Water
Ice-caps	:	02.0	Fresh Water
Ground water	:	0.68	
Fresh water lakes	:	0.009	
Inland seas and salt lakes	:	0.009	
Atmosphere	:	0.0019	
Rivers	:	0.0001	
		100.00	

Water distribution can be demonstrated by a simple activity (see activity box).

Activity

Take 2 litres of water. Let it represent the total water on the surface of the earth. Measure out 12 spoons of water from this vessel into another bowl. The water that is left behind in the vessel represents the salty water found in oceans and seas. This water is obviously not fit for consuming. It is saline (contains salts).

The 12 spoons of water that was taken in a bowl is the total amount of fresh water on earth. The figure shows us the distribution of this fresh water. See for yourself how much water can actually be used by you.



Distribution of fresh water

Water is absolutely essential for survival. Water alone can quench our thirst when we are thirsty. Now don't you think we are wasting a precious resource when we use water carelessly?



- Why is water important for us?
- Suggest some ways in which water can be conserved (a) in your home (b) in your school

Ocean Circulation

There is something magical about walking bare feet on the seashore. The wet sand on the beach, the cool breeze, the seabirds, the smell of the salt in the air and music of the waves; everything is so fascinating. Unlike the calm waters of ponds and lakes, ocean water keeps moving continuously. It is never still. The movements that occur in oceans can be broadly categorised as: waves, tides and currents.



Fig. 5.3: Pacific Ocean

Do you know?

March 22 is celebrated as World Water Day when the need to conserve water is reinforced in different ways.

Do you know?

Waves are formed when winds scrape across the ocean surface. The stronger the wind blows, the bigger the wave becomes.

Waves

When you are playing throw ball on the beach and the ball falls into the water, what happens? It is fun to watch how the ball gets washed back to the shore by the waves. When the water on the surface of the ocean rises and falls alternately, they are called waves.

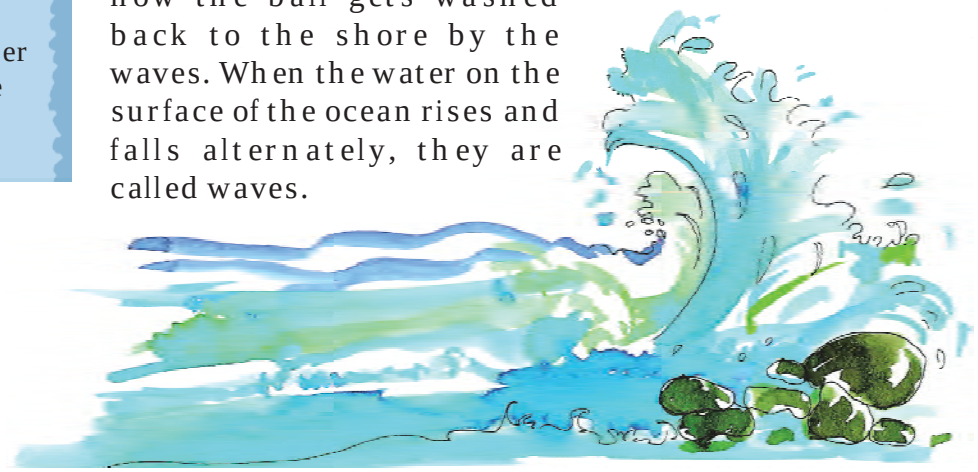


Fig. 5.4: Waves

Do you know?

Tsunami is a Japanese word that means "Harbour waves" as the harbours get destroyed whenever there is tsunami.

During a storm, the winds blowing at very high speed form huge waves. These may cause tremendous destruction. An earthquake, a volcanic eruption or underwater landslides can shift large amounts of ocean water. As a result a huge tidal wave called tsunami, that may be as high as 15m., is formed. The largest tsunami ever measured was 150m. high. These waves travel at a speed of more than 700 km. per hour. The tsunami of 2004 caused wide spread damage in the coastal areas of India. The Indira point in the Andaman and Nicobar islands got submerged after the tsunami.

TSUNAMI – THE EARTH'S PANDEMONIUM

Tsunami or the harbour wave struck havoc in the Indian Ocean on the 26 December 2004. The wave was the result of the earthquake that had its epicenter close to the western boundary of Sumatra. The magnitude of the earthquake was 9.0 on the Richter scale. As the Indian plate went under the Burma plate, there was a sudden movement of the sea floor, causing the earthquake. The ocean floor was displaced by about 10 – 20m and tilted in a downwardly direction. A huge mass of ocean water flowed to fill in the gap that was being created by the displacement. This marked the withdrawal of the water mass from the coastlines of the landmasses in the south and southeast Asia. After thrusting of the Indian plate below the Burma plate, the water mass rushed back towards the coastline. Tsunami travelled at a speed of about 800km. per hour, comparable to speed of commercial aircraft and completely washed away

some of the islands in the Indian ocean. The Indira point in the Andaman and Nicobar islands that marked the southernmost point of India got completely submerged. As the wave moved from earthquake epicenter from Sumatra towards the Andaman islands and Sri Lanka the wave length decreased with decreasing depth of water. The travel speed also declined from 700-900km. per hour to less than 70km. per hour. Tsunami waves travelled upto a depth of 3 km. from the coast killing more than 10,000 people and affected more than lakh of houses. In India, the worst affected were the coastal areas of Andhra Pradesh, Tamil Nadu, Kerala, Puducherry and the Andaman and Nicobar Islands.

While the earthquake cannot be predicted in advance, it is possible to give a three-hour notice of a potential tsunami. Such early warning systems are in place across the Pacific ocean, but not in the Indian Ocean. Tsunamis are rare in the Indian Ocean as the seismic activity is less as compared to the Pacific.



Destruction caused by tsunami on Tamil Nadu Coast

The tsunami that ravaged the South and South east Asian coasts in December 2004, is the most devastating tsunami in the last several hundred years. The large damage caused to life and property was primarily a result of lack of monitoring, the early warning systems and knowledge among the coast dwellers of Indian ocean.

The first indication that tsunami is approaching is the rapid withdrawal of water from the coastal region, followed by destructive wave. When this happened on the coast, instead of people going to high ground, they started assembling at the coast to view the miracle. As a consequence there was a large casualty of curious onlookers when the gigantic wave (tsunami) struck.

Tides

The rhythmic rise and fall of ocean water twice in a day is called a tide. It is high tide when water covers much of the shore by rising to its highest level. It is low tide when water falls to its lowest level and recedes from the shore.

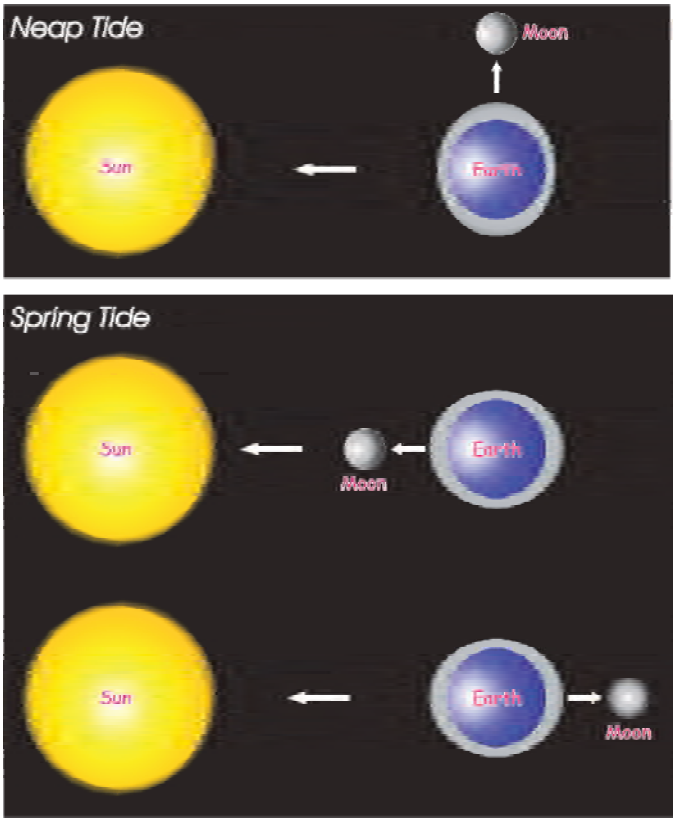


Fig. 5.5: Spring Tides and Neap Tide

The strong gravitational pull exerted by the sun and the moon on the earth's surface causes the tides. The water of the earth closer to the moon gets pulled under the influence of the moon's gravitational force and causes high tide. During the full moon and new moon days, the sun, the moon and the earth are in the same line and the tides are highest. These tides are called spring tides. But when the moon is in its first and last quarter, the ocean waters get drawn in diagonally opposite directions by the gravitational pull of sun and moon resulting in low tides. These tides are called neap tides (Fig. 5.5).

High tides help in navigation. They raise the water level close to the shores. This helps the ships to arrive at the harbour more easily. The high tides also help in fishing. Many more fish come closer to the shore during the high tide. This enables fishermen to get a plentiful catch. The rise and fall of water due to tides is being used to generate electricity in some places.



Fill three-fourths of a bucket with tap water. Heat the water by putting an immersion rod on one side of the bucket. On the other side introduce an ice tray just removed from the freezer. Add a drop of red ink to observe the path of current by the process of convection.

Ocean Currents

Ocean currents are streams of water flowing constantly on the ocean surface in definite directions. The ocean currents may be warm or cold (Fig. 5.6). Generally, the warm ocean currents originate near the equator and move towards the poles. The cold currents carry water from polar or higher latitudes to tropical or lower latitudes. The Labrador Ocean current is cold current while the Gulf Stream is a warm current. The ocean current influence the temperature conditions of the area. Warm currents bring about warm temperature over land surface. The areas where the warm and cold currents meet provide the best fishing grounds of the

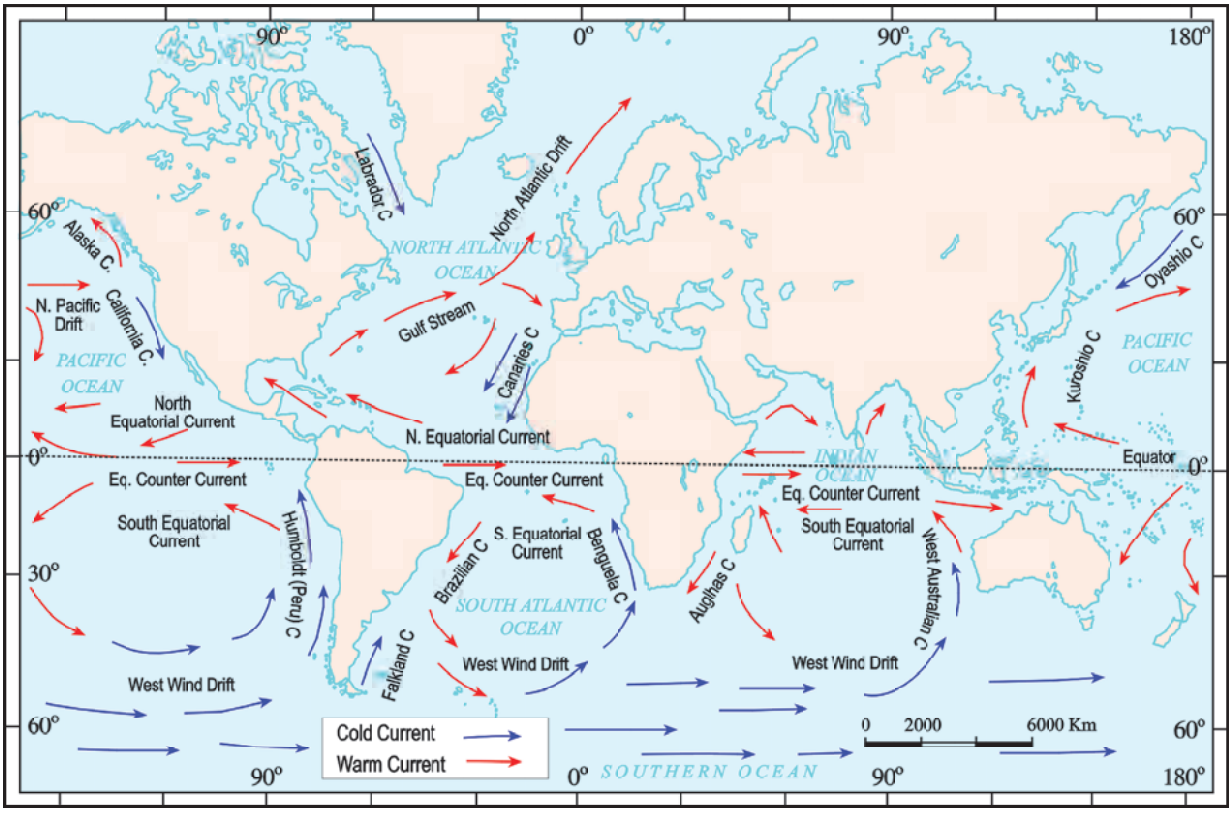


Fig. 5.6: Ocean Currents

world. Seas around Japan and the eastern coast of North America are such examples. The areas where a warm and cold current meet also experience foggy weather making it difficult for navigation.



1. Answer the following questions.
   (i) What is precipitation?
   (ii) What is water cycle?
   (iii) What are the factors affecting the height of the waves?
   (iv) Which factors affect the movement of ocean water?
   (v) What are tides and how are they caused?
   (vi) What are ocean currents?
2. Give reasons.
   (i) Ocean water is salty.
   (ii) The quality of water is deterioting.

3. Tick the correct answer.

(i) The process by which water continually changes its form and circulates between oceans, atmosphere and land

(a) Water cycle (b) Tides (c) Ocean currents

(ii) Generally the warm ocean currents originate near

(a) Poles (b) Equator (c) None of these

(iii) The rythmic rise and fall of ocean water twice in a day is called

(a) Tide (b) Ocean current (c) Wave

4. Match the following.

(i) Caspian Sea	(a) Largest lake
(ii) Tide	(b) Periodic rise and fall of water
(iii) Tsunami	(c) Strong seismic waves
(iv) Ocean currents	(d) Streams of water moving along definite paths
	(e) Water cycle

5. For fun.

Be a Detective

(i) The name of one river is hidden in each of the sentences below. Spot it.

Example: Mandira, Vijayalakshmi and Surinder are my best friends

Answer: Ravi

(a) The snake charmer's bustee, stables where horses are housed, and the piles of wood, all caught fire accidentally. (Hint: Another name for River Brahmputra)

(b) The conference manager put pad, material for reading and a pencil for each participant. (Hint: A distributary on the Ganga-Brahmputra delta)

(c) Either jealousy or anger cause a person's fall (Hint: Name of a juicy fruit!)

(d) Bhavani germinated the seeds in a pot (Hint: Look for her in West Africa)

(e) "I am a zonal champion now" declared the excited athlete. (Hint: The river that has the biggest basin in the world)

(f) The tiffin box rolled down and all the food fell in dusty potholes. (Hint: Rises in India and journeys through Pakistan)

(g) Malini leaned against the pole when she felt that she was going to faint. (Hint: Her delta in Egypt is famous)

(h) Samantha mesmerised everybody with her magic tricks. (Hint: London is situated on her estuary)

(i) "In this neighbourhood, please don't yell! Owners of these houses like to have peace". Warned my father when we moved into our new flat". (Hint: colour!)

(j) 'Write the following words, Marc!' "On", "go", "in"... ... .. said the teacher to the little boy in KG Class. (Hint: Rhymes with 'bongo')

Now make some more on your own and ask your classmates to spot the hidden name. You can do this with any name: that of a lake, mountains, trees, fruits, school items etc.

Carry on Detective

(ii) With the help of an atlas, draw each river which you discoverd in For fun (i), on an outline map of the world.

6 Natural Vegetation and Wild Life

0762CH06

Salima was excited about the summer camp she was attending. She had gone to visit Manali in Himachal Pradesh along with her class mates. She recalled how surprised she was to see the changes in the landform and natural vegetation as the bus climbed higher and higher. The deep jungles of the foothills comprising sal and teak slowly disappeared. She could see tall trees with thin pointed leaves and cone shaped canopies on the mountain slopes. She learnt that those were coniferous trees. She noticed blooms of bright flowers on tall trees. These were the rhododendrons. From Manali as she was travelling up to Rohtang pass she saw that the land was covered with short grass and snow in some places.



Fig. 6.1: Rhododendron

From Salima's observations, we surmise that there is a close relationship between height of land and the character of vegetations. With the change in height, the climate changes and that changes natural vegetation. The growth of vegetation depends on temperature and moisture. It also depends on factors like slope and thickness of soil.

The type and thickness of natural vegetation varies from place to place because of the variation in these factors.

Natural vegetation is generally classified in to three broad categories as follows:

(a) *Forests*: Which grow where temperature and rainfall are plentiful to support a tree cover. Depending upon these factors, dense and open forests are grown.



Let's do

Now can you tell why Salima saw changes in the natural vegetation as she climbed higher and higher? What types of vegetations did she see in the Himalayas starting with the foothills and going to the higher altitudes?



Let's do

- Like Salima, when you go to visit any new place, notice the type of natural vegetation occurring there and try to think of factors responsible for the growth of such vegetation in that habitat.
- Note down if any human interference has taken place in that area in terms of deforestation, grazing, cultivation of cash crops, constructional activities etc.



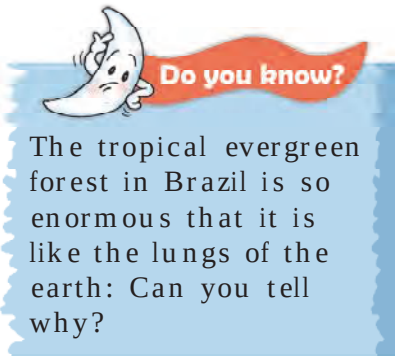
Fig. 6.2: Thorny shrubs

(b) *Grasslands*: Which grow in the region of moderate rain.

(c) *Shrubs*: Thorny shrurbs and scrubs grow in the dry region (Fig. 6.2).

Salima was sharing her experience of Himalayan trip with her father. Her father visited various places in the world. He told Salima about his observations of the variety of vegetation in different parts of different continents.He mentioned about coniferous forests in the sub polar regions, thorny bushes in the deserts, thick tropical hardwood forest in the humid regions and many more. Salima realised the Himalayas have almost all variety of vegetation which one can see while moving from the equator to the polar region.

The changes in the type of natural vegetation occur mainly because of the changes of climatic condition. Let us get to know the different types of natural vegetation of the world with their characteristic features and wildlife inhabiting there.



FORESTS

Tropical Evergreen Forests

These forests are also called tropical rainforests (Fig. 6.3). These thick forests occur in the regions near the equator and close to the tropics. These regions are hot and receive heavy rainfall throughout the year. As there is no particular dry season, the trees do not shed their leaves altogether. This is the reason they are called evergreen. The thick canopies of the closely spaced trees do not allow the sunlight to penetrate inside the forest even in the day time. Hardwood trees like rosewood, ebony, mahogany are common here.

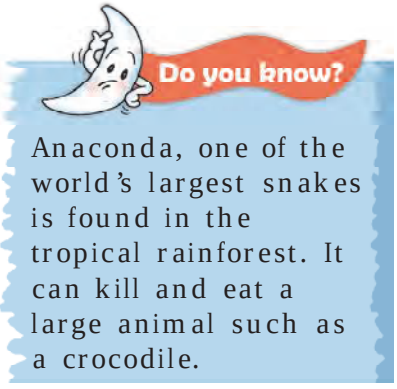




Fig. 6.3: A Tropical Evergreen Forest

Tropical Deciduous Forests

Tropical deciduous are the monsoon forests found in the large part of India,northern Australia and in central America (Fig. 6.4).These regions experience seasonal changes. Trees shed their leaves in the dry season to conserve water. The hardwood trees found in these forests are sal, teak, neem and shisham. Hardwood trees are extremely useful for making furniture, transport and constructional materials. Tigers, lions, elephants, langoors and monkeys are the common animals of these regions (Fig. 6.5, 6.6 and 6.8).

Let's do

- Where in India do tropical evergreen and tropical deciduous forests occur? Name the states.
- Which type of forest dominates most part of India?



Fig. 6.4: A Tropical Deciduous Forest



Fig. 6.5: A Tiger

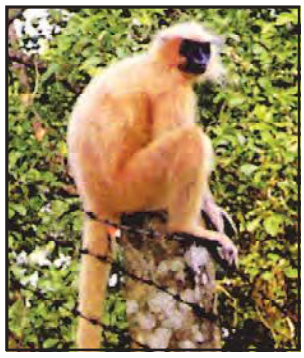


Fig. 6.6: A Golden Langoor

Temperate Evergreen Forests

The temperate evergreen forests are located in the mid-latitudinal coastal region (Fig. 6.7). They are commonly found along the eastern margin of the continents, e.g., In south east USA, South China and in South East Brazil. They comprise both hard and soft wood trees like oak, pine, eucalyptus, etc.



Fig. 6.7: A Temperate Evergreen Forest

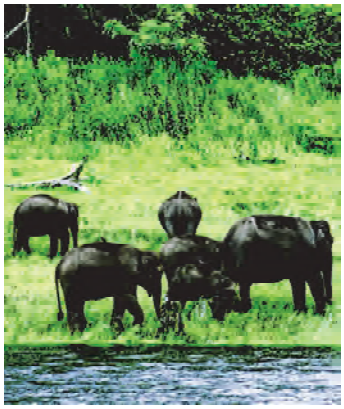


Fig. 6.8: Elephants



Fig. 6.9: A Pheasant



Fig. 6.10: A Monal

Temperate Deciduous Forests

As we go towards higher latitudes, there are more temperate deciduous forests (Fig. 6.11). These are found in the north eastern part of USA, China, New Zealand, Chile and also found in the coastal regions of Western Europe. They shed their leaves in the dry season. The common trees are oak, ash, beech, etc. Deer, foxes, wolves are the animals commonly found. Birds like pheasants, monals are also found here (Fig. 6.9 and 6.10).



Fig. 6.11: A Temperate Deciduous Forest

Do you know?

- Mediterranean trees adapt themselves to dry summers with the help of their thick barks and wax coated leaves which help them reduce transpiration.
- Mediterranean regions are known as 'Orchards of the world' for their fruit cultivation.

Mediterranean Vegetation

You have learnt that most of the east and north east margins of the continents are covered by temperate evergreen and deciduous trees. The west and south west margins of the continents are different. They have Mediterranean vegetation (Fig. 6.12). It is mostly found in the areas around the Mediterranean sea in Europe, Africa and Asia, hence the name. This kind of vegetation is also found outside the actual Mediterranean region in California in the USA, south west Africa, south western



Fig. 6.12: A vineyard in the Mediterranean Region

South America and South west Australia. These regions are marked for hot dry summers and mild rainy winters. Citrus fruits such as oranges, figs, olives and grapes are commonly cultivated here because people have removed the natural vegetation in order to cultivate what they want to. There isn't much wildlife here.

Coniferous Forests

In the higher latitudes (50° – 70°) of Northern hemisphere the spectacular Coniferous forests are found (Fig. 6.13 a and b). These are also called as Taiga. These forests are also seen in the higher altitudes. These are the trees which Salima found in the Himalayas in abundance. They are tall, softwood evergreen trees. The woods of these trees are very useful for making pulp, which is used for manufacturing paper and newsprint. Match boxes and packing boxes are also made from softwood. Chir, pine, cedar are the important variety of trees in these forests. Silver fox, mink, polar bear are the common animals found here.

Let's do

- Look around in your surroundings and find out the articles made of hard wood and soft wood.
- Find out and learn the names of few trees of your locality.

Do you know?

Taiga means pure or untouched in the Russian language



Fig. 6.13 (a): A Coniferous Forest



Fig. 6.13 (b): Snow covered Coniferous Forest

Grasslands

Tropical grasslands: These occur on either side of the equator and extend till the tropics (Fig. 6.14). This vegetation grows in the areas of moderate to low amount of rainfall. The grass can grow very tall, about 3 to 4 metres in height. Savannah grasslands of Africa are of this type. Elephants, zebras, giraffes, deer, leopards are common in tropical grasslands (Fig. 6.15).



Fig. 6.14: Tropical Grassland



Fig. 6.15: Giraffes

Do you know?

Grasslands are known by different names in different regions.

Tropical Grasslands

East Africa- Savanna
Brazil- Campos
Venezuela- Llanos

Temperate Grasslands

Argentina- Pampas
N. America- Prairie
S. Africa- Veld
C. Asia- Steppe
Australia- Down

Temperate grasslands: These are found in the mid-latitudinal zones and in the interior part of the continents. Usually, grass here is short and nutritious.Wild buffaloes, bisons, antilopes are common in the temperate region.

Thorny bushes: These are found in the dry desert like regions.Tropical deserts are located on the western margins of the continents. The vegetation cover is scarce here because of scanty rain and scorching heat. Identify the desert regions in the world map. Can you name the great desert of India? Name some of the common animals of the desert which you have learnt earlier.

If you reach the polar region you will find the place extremely cold. The growth of natural vegetation is very limited here. Only mosses, lichens and very small shrubs are found here. It grows during the very short summer. This is called Tundra type of vegetation. This vegetation is found in the polar areas of Europe, Asia and North America. The animals have thick fur and thick skin to protect themselves from the cold climatic conditions. Seal, walruses, musk-oxen, Arctic owl, Polar bear and snow foxes are some of the animals found here (Fig. 6.16).

Salima's father showed her some photographs of thick forests. In some of the photographs, Salima observed that people were cutting trees and clearing the forests. Her father explained that the local people wanted their land for agriculture and settlements, so they cleared up the forests. Salima started wondering if all forests are cleared, then where will the wild life go? Will the forest take its original shape again? If people go on cutting the trees like this, will there be enough oxygen, water vapour, timber, fruits, nuts available in future?

Do you agree with Salima? Hold a discussion with your friends about the depletion of our diversified flora and fauna. Suggest some measures to conserve them.



Walrus



Polar Bear



Seal

Fig. 6.16



1. Answer the following questions.

(i) Which are the two factors on which the growth of vegetation mostly depends?
(ii) Which are the three broad categories of natural vegetation?
(iii) Name the two hardwood trees commonly found in tropical evergreen forest.
(iv) In which part of the world are tropical deciduous forest found?
(v) In which climatic conditions are citrus fruits cultivated?
(vi) Mention the uses of coniferous forest.
(vii) In which part of the world is seasonal grassland found?

2. Tick the correct answer.

(i) Mosses and Lichens are found in:
(a) Desertic Vegetation
(b) Tropical evergreen forest
(c) Tundra vegetation

(ii) Thorny bushes are found in:
(a) Hot and humid tropical climate
(b) Hot and dry desertic climate
(c) Cold polar climate

(iii) In tropical evergreen forest, one of the common animals is:
(a) Monkey (b) Girraffe (c) Camel

(iv) One important variety of coniferous forest is:
(a) Rosewood (b) Pine (c) Teak

(v) Steppe grassland is found in
(a) S. Africa (b) Australia (c) Central Asia

3. Match the following.

(i) Walrus	(a) Soft wood tree
(ii) Cedar	(b) An animal of tropical deciduous forest
(iii) Olives	(c) A polar animal
(iv) Elephants	(d) Temperate grassland in Australia
(v) Campos	(e) Thorny shrubs
(vi) Downs	(f) A citrus fruit
	(g) Tropical grassland of Brazil

4. Give reasons.

(i) The animals in polar region have thick fur and thick skin.
(ii) Tropical deciduous trees shed their leaves in the dry season.
(iii) The type and thickness of vegetation changes from place to place.

5. Activity.

(i) Collect pictures and photographs of forests and grasslands of different parts of world. Write one sentence below each picture.
(ii) Make a collage of rainforest, grassland and coniferous forests.

6. For fun.

In the crossword table given below, some words are hidden. They are all about vegetation and wildllife and are to be found horizontally and vertically. Two have been worked out for you. Work in pairs with a friend.

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



7 Human Environment–Settlement, Transport and Communication

0762CH07

In Chapter 1 you have learnt that early human beings depended entirely on nature for food, clothing and shelter; but with time they learnt new skills to grow food, build homes and develop better means of transport and communication. In this way they modified the environment where they lived.

Settlements are places where people build their homes. Early human beings lived on trees and in caves. When they started to grow crops it became necessary to have a permanent home. The settlements grew near the river valleys as water was available and land was fertile. With the development of trade, commerce and manufacturing, human settlements became larger. Settlement flourished and civilizations developed near river valleys. Do you recall the names of civilization that grew along the banks of rivers Indus, Tigris, Nile and Hwang-He.

Settlements can be permanent or temporary. Settlements which are occupied for a short time are called temporary settlements. The people living in deep forests, hot and cold deserts and mountains often dwell in such temporary settlements. They practice hunting, gathering, shifting cultivation and transhumance. However more and more settlements today are permanent settlements. In these settlements, people build homes to live in.

Do you know?

The place where a building or a settlement develops is called its site.

The natural conditions for selection of an ideal site are-

1. favourable climate
2. availability of water
3. suitable land
4. fertile soil



Fig. 7.1: Human Settlement

Glossary

Transhumance: It is a seasonal movement of people. People who rear animals move in search of new pastures according to changes in seasons.



It was Mary's birthday party. She and her friends were waiting for Gurpreet to arrive so that Mary could cut the cake. At last Gurpreet arrived- tired, coughing and wheezing. She explained that the traffic jam was terrible. Mary's mother Mrs.Thomas patted Gurpreet's back and sighed, "Oof! The pollution in our city!" Prasad had recently come from his village. He asked, "Why do we have such traffic jams and such pollution in the cities?" "The number of vehicles is increasing day by day due to the growing population in the cities", Mary's father, Mr. Thomas replied. Mary asked, "Then why are people coming to the cities?" Her mother replied, "They come looking for jobs, better education and medical facilities." Mary further enquired, "If so many people keep coming to cities, where will all the people live?" Mr. Thomas said, "That is why you see so many slums and squatter settlements where people stay in congested and unhygienic conditions. Shortage of power and water supply are common problems in the cities". Prasad said, "Our villages may not have big cinema halls, well-equipped schools and good hospitals, but we have lot of open spaces and fresh air to breathe in. When my grandfather was sick we had to rush him to the city hospital."



Fig. 7.2: Compact Settlement



Fig. 7.3: Scattered Settlement

From the above conversation we can identify two different pictures of settlements – the rural and the urban settlements. The villages are rural settlement where people are engaged in activities like agriculture, fishing, forestry, crafts work and trading etc. Rural settlements can be compact or scattered. A compact settlement is a closely built area of dwellings, wherever flat land is available (Fig. 7.2). In a scattered settlement dwellings are spaced over an extensive area. This type of settlement is mostly found in hilly tracts, thick forests, and regions of extreme climate (Fig. 7.3).

In rural areas, people build houses to suit their environment. In regions

of heavy rainfall, they have slanting roofs. Places where water accumulates in the rainy season the houses are constructed on a raised platform or stilts (Fig. 7.4).



Fig. 7.4: Houses on Stilts

Thick mud walled houses with thatched roofs are very common in areas of hot climate. Local materials like stones, mud, clay, straw etc are used to construct houses.

The towns are small and the cities are larger urban settlements. In urban areas the people are engaged in manufacturing, trading, and services. Name some of the villages, towns and cities of your state.



Where do you find dwellings made of ice? Who makes them and what are they called?

TRANSPORT

Transport is the means by which people and goods move. In the early days it took a great deal of time, to travel long distances. People had to walk and used animals to carry their goods. Invention of the wheel made transport easier. With the passage of time different means of transport developed but even today people use animals for transport (Fig. 7.5).



Fig. 7.5: Horse cart as a mode of transportation

In our country donkeys, mules, bullocks and camels are common. In the Andes Mountains of South America, llamas are used, as are yaks in Tibet. The early traders from other countries used to take several months to reach India. They took either the sea route or the land route. Aeroplanes have made travel faster. Now it takes only 6-8 hours to travel from India to Europe. Modern means of transport thus saves time and energy.



List the different modes of transport used by the students of your class while coming to school.

Do you know?

There are several National and State highways in India. The latest development in India is the construction of Express Ways. The Golden Quadrilateral connects Delhi, Mumbai, Chennai and Kolkata.

The four major means of transport are roadways, railways, waterways and airways.

Roadways

The most commonly used means of transport especially for short distances are roads. They can be metalled (*pucca*) and unmetalled (*kutcha*) (Fig. 7.6 and 7.7). The plains have a dense network of roads. Roads have also been build in terrains like deserts, forests and even high mountains. Manali-Leh highway in the Himlayan Mountains is one of the highest roadways in the world. Roads built underground are called subways/ under paths. Flyovers are built over raised structures.



Fig. 7.6: Metalled Road



Fig. 7.7: Unmetalled Road

Do you know?

The train from Xining to Lhasa runs at an altitude of 4,000m above sea level and the highest point is 5,072 m



Railways

The railways carry heavy goods and people over long distances quickly and cheaply. The invention of the steam engine and the Industrial Revolution helped in speedy development of rail transport. Diesel and electric engines have largely replaced the steam engines. In places super fast trains have been introduced to make the journey faster. The railway network is well developed over the plain areas. Advanced technological skills have enabled laying of railway lines in difficult mountain terrains also. But these are much fewer in number. Indian railway network is well developed. It is the largest in Asia.

Do you know?

The Trans-Siberian Railway is the longest railway system connecting St. Petersburg in Western Russia to Vladivostok on the Pacific coast.



Trans – Siberian Railway

WATERWAYS

You have already learnt that since early days waterways were used for transportation. Waterways are the cheapest for carrying heavy and bulky goods over long distances. They are mainly of two types – inland waterways and sea routes.

Navigable rivers and lakes are used as inland waterways. Some of the important inland waterways are the Ganga-Brahmaputra river system, the Great Lakes in North America and the river Nile in Africa.

Sea routes and oceanic routes are mostly used for transporting merchandise and goods from one country to another. These routes are connected with the ports. Some of the important ports of the world are Singapore and Mumbai in Asia, New York, Los Angeles in North America, Rio de Janerio in South America, Durban and Cape Town in Africa, Sydney in Australia, London and Rotterdam in Europe (Fig. 7.11). Can you name some more ports of the world?



Fig. 7.8: Inland Waterways

Airways

This is the fastest way of transport developed in the early twentieth century. It is also the most expensive due to high cost of fuels. Air traffic is adversely affected by bad weather like fog and storms. It is the only mode of transport to reach the most remote and distant areas especially where there are no roads and railways. Helicopters are extremely useful in most inaccessible areas and in time of calamities for rescuing people and distributing food, water, clothes and medicines (Fig. 7.9). Some of the important airports are Delhi, Mumbai, New York, London, Paris, Frankfurt and Cairo (Fig. 7.11).



Fig. 7.9: A Helicopter

Let's do

Find out the names of some newspapers and TV news channels in English, Hindi and a regional language.

Communication

Communication is the process of conveying messages to others. With the development of technology humans have devised new and fast modes of communication. The Fig. 7.10 explains the evolution of the communication system.

The advancement in the field of communication has brought about an information revolution in the world. Different modes of communication are used to provide information, to educate as well as to entertain. Through newspapers, radio and television we can communicate with a large number of people. They are therefore called mass media. The satellites have made communication even faster. Satellites have helped in oil exploration, survey of forest, underground water, mineral wealth, weather forecast and disaster warning. Now we can send electronic mails or e-mails through Internet. Wireless telephonic communications through cellular phones have become very popular today. Internet not only provides us with worldwide information and interaction but has also made our lives more comfortable. Now we can reserve tickets for railways, airways and even cinemas and hotels sitting at home. With this kind

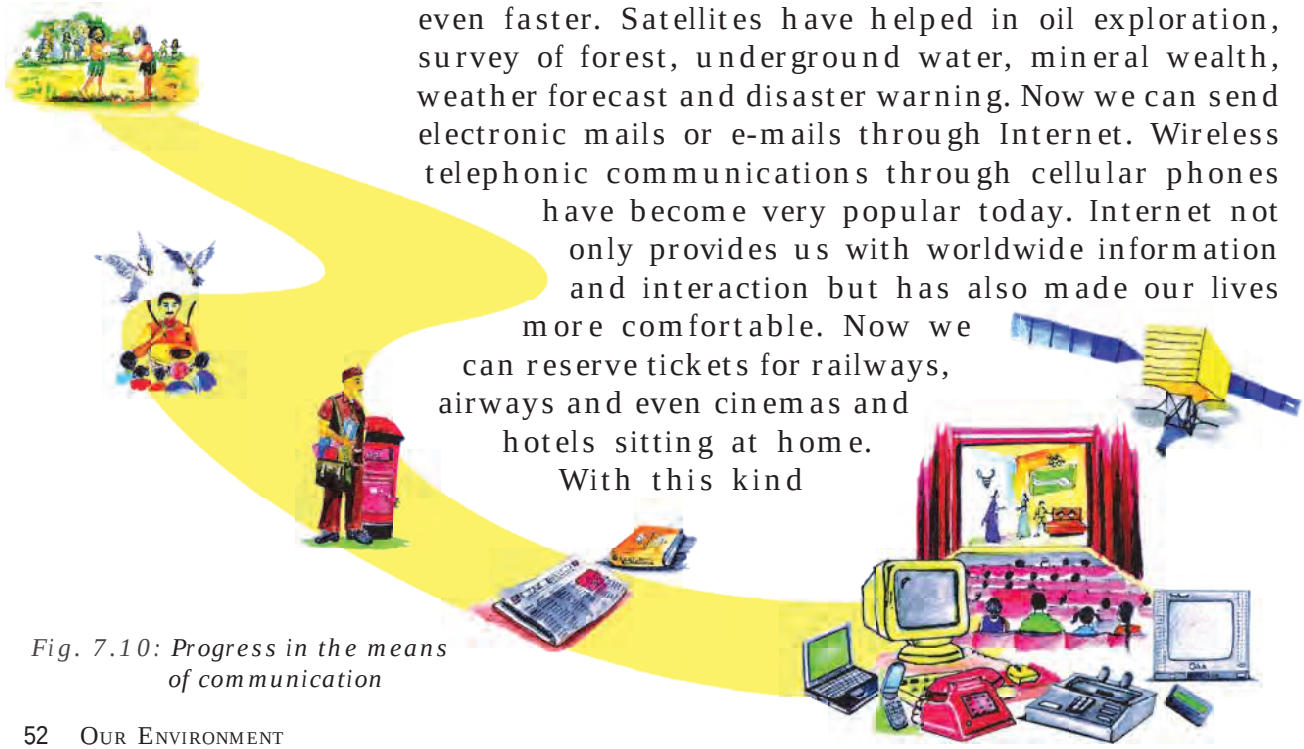


Fig. 7.10: Progress in the means of communication

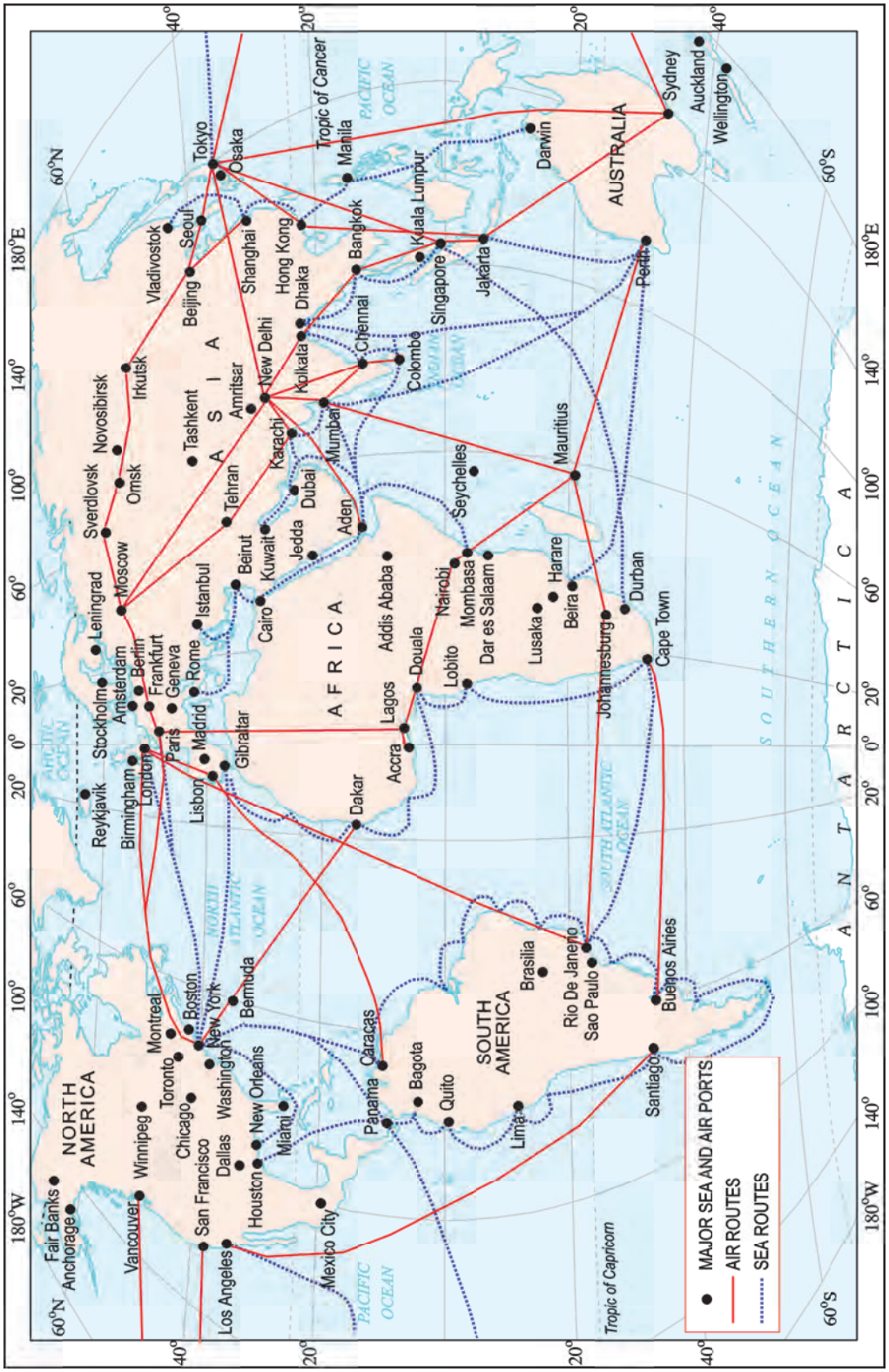


Fig. 7.11: World – Major Sea Ports and Airports

of inter connectivity of people, services and institutions – across the world, we are a large global society.



1. Answer the following questions.

(i) What are the four means of transport?

(ii) What do you understand by the term 'settlement'?

(iii) Which are the activities practised by the rural people?

(iv) Mention any two merits of railways.

(v) What do you understand by communication?

(vi) What is mass media?

2. Tick the correct answer.

(i) Which is NOT a means of communication?
(a) telephone (b) books (c) table

(ii) Which type of road is constructed under the ground?
(a) fly over (b) expressways (c) subways

(iii) Which mode of transport is most suitable to reach an island?
(a) ship (b) train (c) car

(iv) Which vehicle does not pollute the environment
(c) cycle (b) bus (c) aeroplane

3. Match the following.

(i) Internet	(a) areas where people are engaged in manufacturing, trade and services
(ii) Canal route	(b) closely built area of houses
(iii) Urban areas	(c) houses on stilts
(iv) Compact settlement	(d) inland waterway
	(e) a means of communication

4. Give reasons.

(i) Today's world is shrinking.

5. For fun.

(i) Conduct a survey in your locality and find out how people commute to their respective workplaces using –
(a) more than two modes of transport
(b) more than three modes of transport
(c) stay within walking distance.

(ii) Mention which mode of communication you will prefer most in the following situations –
(a) Your grandfather has suddenly fallen ill. How will you inform the doctor?
(b) Your mother wants to sell the old house. How will she spread this news?
(c) You are going to attend the marriage of your cousin for which you will be absent from the school for the next two days. How will you inform the teacher?
(d) Your friend has moved out with his/ her family to New York. How will you keep in touch on a daily basis?

8 Human Environment Interactions
The Tropical and the Subtropical Region

0762CH08

Renuka was excited. Shrikant Uncle was home after a gap of nearly four months. He was a wildlife photographer and travelled widely. Renuka's interest in wildlife and forests began at an early age, when her uncle introduced her to books on nature. Pictures of distant lands and people, who lived there, always fascinated her.



Fig. 8.1: People from various parts of the world

"In these pictures Renuka, you can see people from different parts of the world – some from dry deserts, some from frozen lands and some from hot wet rainforests." "They look so different from me", observed Renuka. "They may look different, but they share the same basic needs of life – food, clothing and shelter", explained Shrikant Uncle. "Their children do the same things as you probably do, play games, quarrel sometimes and then make-up, sing, dance and help the families with various things that need to be done. They live closer to nature and very early in their lives have learnt to care for nature. They learn how to catch fish and how to collect material from the forests."

In Chapters 8, 9 and 10, you will learn about the life of people in the different natural regions of the world.

Do you know?

When Spanish explorers discovered the Amazon river, they were attacked by a group of local tribes wearing headgears and grass skirts. These people reminded them of the fierce tribes of women warriors known in ancient Roman Empire as the Amazons. Hence the name Amazon.

Life in the Amazon Basin

Before learning about the Amazon basin, let us look at the map (Fig. 8.2). Notice that the tropical region lies very close to the equator; between 10°N and 10°S. So, it is referred to as the equatorial region. The river Amazon flows through this region. Notice how it flows from the mountains to the west and reaches the Atlantic Ocean to the east.

The place where a river flows into another body of water is called the river's mouth. Numerous tributaries join the Amazon River to form the Amazon basin. The river basin drains portions of Brazil, parts of Peru, Bolivia, Ecuador, Columbia and a small part of Venezuela.

Name the countries of the basin through which the equator passes.

Glossary

Tributaries: These are small rivers that join the main river. The main river along with all its tributaries that drain an area forms a river basin or the catchment area. The Amazon Basin is the largest river basin in the world.



Fig. 8.2: The Amazon Basin in South America

Climate

As you now know, the Amazon Basin stretches directly on the equator and is characterized by hot and wet climate throughout the year. Both day and nights are almost equally hot and humid. The skin feels sticky. It rains almost everyday, that too without much warning. The day temperatures are high with very high humidity. At night the temperature goes down but the humidity remains high.

Rainforests

As it rains heavily in this region, thick forests grow (Fig. 8.3). The forests are in fact so thick that the dense "roof" created by leaves and branches does not allow the sunlight to reach the ground. The ground remains dark and damp. Only shade tolerant vegetation may grow here. Orchids, bromeliads grow as plant parasites.



Fig. 8.3 : The Amazon Forest



Fig. 8.4 : Toucans

The rainforest is rich in fauna. Birds such as toucans (Fig. 8.4), humming birds, bird of paradise with their brilliantly coloured plumage, oversized bills for eating make them different from birds we commonly see in India. These birds also make loud sounds in the forests. Animals like monkeys, sloth and ant-eating tapirs are found here (Fig. 8.5). Various species of reptiles and snakes also thrive in these jungles. Crocodiles, snakes, pythons abound. Anaconda and boa constrictor are some of the species. Besides, the basin is home to thousands of species of insects. Several species of fishes including the flesh-eating Piranha fish is also found in the river. This basin is thus extraordinarily rich in the variety of life found there.



Fig. 8.5 : Tapir

People of the Rainforests

People grow most of their food in small areas after clearing some trees in the forest. While men hunt and fish along the rivers, women take care of the crops. They mainly grow



Do you know?

Bromeliads are special plants that store water in their leaves. Animals like frogs use these pockets of water for laying their eggs.



Let's do

Some TV channels broadcast documentaries on the wildlife of the world. Try to watch some of the films and share your experience with the class.

Do you know?

Slash and Burn is a way of cultivating land where farmers clear a piece of land by slashing or cutting down trees and bushes. These are then burnt, which releases the nutrients into the soil. Now crops are grown in this cleared field for a few years.

After repeatedly using the patch of land, the soil looses its nutrients. So it is abandoned. Then they clear another plot of land to plant. In the mean time young trees grow in the old field. In this way soil fertility is restored. People can then return to it and start cultivating it again.

tapioca, pineapple and sweet potato. As hunting and fishing are uncertain it is the women who keep their families alive by feeding them the vegetables they grow. They practice "slash and burn agriculture". The staple food is manioc, also known as cassava that grows under the ground like the potato. They also eat queen ants and egg sacs. Cash crops like coffee, maize and cocoa are also grown.

The rainforests provide a lot of wood for the houses. Some families live in thatched houses shaped like beehives. There are other large apartment-like houses called "Maloca" with a steeply slanting roof.

Life of the people of the Amazon basin is slowly changing. In the older days the heart of the forest, could be reached only by navigating the river. In 1970 the Trans Amazon highway made all parts of the rainforest accessible. Aircrafts and helicopters are also used for reaching various places. The indigenous population was pushed out from the area and forced to settle in new areas where they continued to practice their distinctive way of farming.

The developmental activities are leading to the gradual destruction of the biologically diverse rainforests. It is estimated that a large area of the rainforest has been disappearing annually in the Amazon basin. You can see that this destruction of forests has a much wider implication (Fig. 8.6). The topsoil is washed away as the rains fall and the lush forest turns into a barren landscape.

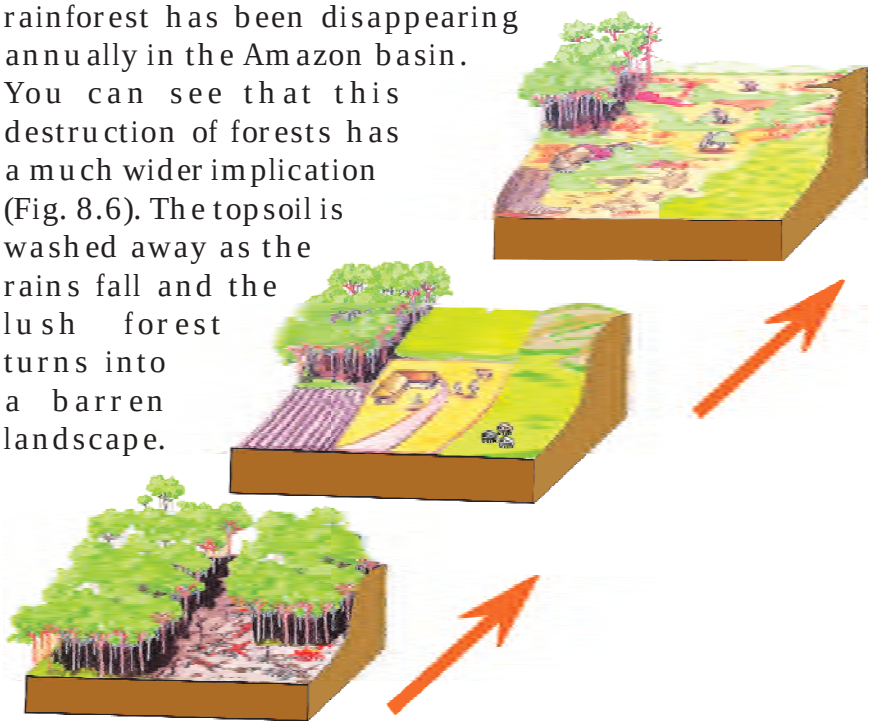


Fig. 8.6: Gradual Destruction of Forests

Life in the Ganga-Brahmaputra Basin

The tributaries of rivers Ganga and Brahmaputra together form the Ganga-Brahmaputra basin in the Indian subcontinent (Fig. 8.8). The basin lies in the sub-tropical region that is situated between 10°N to 30°N latitudes. The tributaries of the River Ganga like the Ghaghra, the Son, the Chambal, the Gandak, the Kosi and the tributaries of Brahmaputra drain it. Look at the atlas and find names of some tributaries of the River Brahmaputra.



Fig. 8.7 Brahmaputra river

The plains of the Ganga and the Brahmaputra, the mountains and the foothills of the

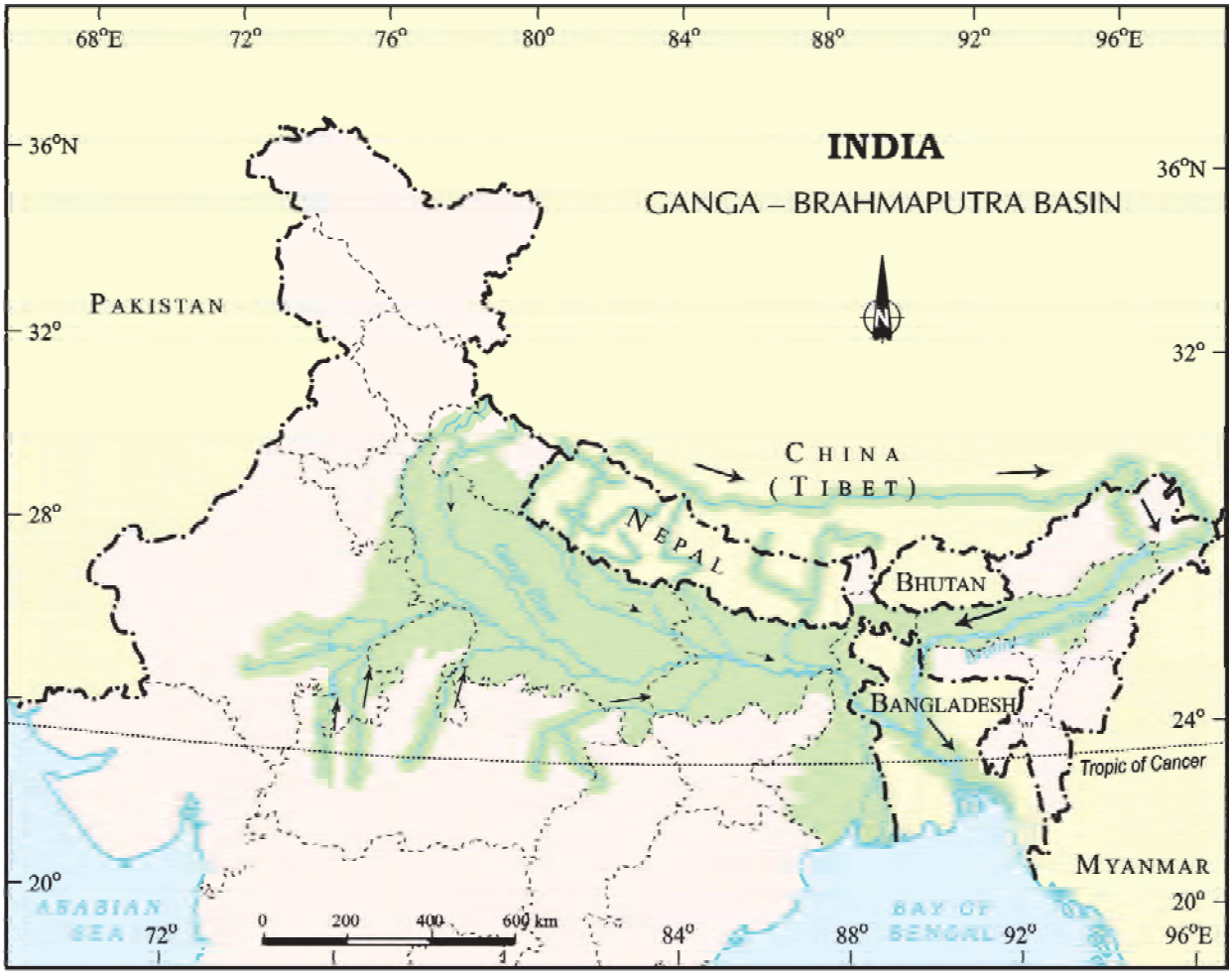


Fig. 8.8: Ganga-Brahmputra Basin

Let's do

River Brahmaputra is known by different names in difference places. Find the other names of the river.

Glossary

Population density: It means the number of persons that live in one sq. km. of area e.g. the population density of Uttarakhand is 189 while the density of West Bengal is 1029 and that of Bihar is 1102.

Activity

Collect some handicrafts made from jute, bamboo and silk. Display them in the class. Find out in which area they were made?

Himalayas and the Sundarbans delta are the main features of this basin. Ox-bow lakes dot the plain area. The area is dominated by monsoon climate. The monsoon brings rains from mid-June to mid-September. The summers are hot and the winters cool.

Look at the map of India (Fig. 8.8). Find out the states in which the Ganga-Brahmputra basin lies.

The basin area has varied topography. The environment plays a dominant role in the distribution of the population. The mountain areas with steep slopes have inhospitable terrain. Therefore less number of people live in the mountain area of the Ganga-Brahmaputra basin. The plain area provides the most suitable land for human habitation. The soil is fertile. Agriculture is the main occupation of the people where flat land is available to grow crops. The density of population of the plains is very high. The main crop is paddy (Fig. 8.9). Since cultivation of paddy requires sufficient water, it is grown in the areas where the amount of rainfall is high.

Wheat, maize, sorghum, gram and millets are the other crops that are grown. Cash crops like sugarcane and jute are also grown. Banana plantations are seen in some areas of the plain. In West Bengal and Assam tea is grown in plantations (Fig. 8.10). Silk is produced through the cultivation of silk worms in parts of Bihar and Assam. In the mountains and hills, where the slopes are gentle, crops are grown on terraces.

The vegetation cover of the area varies according to the type of landforms. In the Ganga and Brahmaputra plain tropical deciduous trees grow, along with teak, sal and peepal. Thick bamboo groves are common in the Brahmaputra plain. The delta area is covered with the



Fig. 8.9 : Paddy Cultivation



Fig. 8.10 : Tea Garden in Assam

mangrove forests. In parts of Uttarakhand, Sikkim and Arunachal Pradesh, coniferous trees like pine, deodar and fir can be seen because the climate is cool and the slopes are steep.

There is a variety of wildlife in the basin. Elephants, tigers, deer and monkeys are common. The one-horned rhinoceros is found in the Brahmaputra plain. In the delta area, Bengal tiger, crocodiles and alligator are found. Aquatic life abounds in the fresh river waters, the lakes and the Bay of Bengal Sea. The most popular varieties of the fish are the rohu, catla and hilsa. Fish and rice is the staple diet of the people living in the area.



Fig. 8.11 : One horned rhinoceros



Fig. 8.12 : Crocodiles

Lake: A source of livelihood

(A case study)



A clean lake

Binod is a fisherman living in the Matwali Maun village of Bihar. He is a happy man today. With the efforts of the fellow fishermen – Ravindar, Kishore, Rajiv and others, he cleaned the maun or the ox-bow lake to cultivate different varieties of fish. The local weed (vallineria, hydrilla) that grows in the lake is the food of the fish. The land around the lake is fertile. He sows crops such as paddy, maize and pulses in these fields. The buffalo is used to plough the land. The community is satisfied. There is enough fish catch from the river – enough fish to eat and enough fish

Do you know?

Terraces are built on steep slopes to create flat surfaces on which crops are grown. The slope is removed so that water does not run off rapidly.



Terrace Farming

Do you know?

In the fresh waters of River Ganga and River Brahmaputra, a variety of dolphin locally called *Susu* (also called blind dolphin) is found. The presence of *Susu* is an indication of the health of the river. The untreated industrial and urban wastes with high amount of chemicals are killing this species.



Blind Dolphin

to sell in the market. They have even begun supply to the neighbouring town. The community is living in harmony with nature. As long as the pollutants from nearby towns do not find their way into the lake waters, the fish cultivation will not face any threat.



A Polluted Lake

Do you know?

To acceletrate the efforts to achieve universal sanitation coverage and to put fours on sanitation, the Prime Minister of India launched the "Swachh Bharat Mission" on 02nd October 2014.



Fig. 8.13: Varanasi along the River Ganga

The Ganga-Brahmaputra plain has several big towns and cities. The cities of Allahabad, Kanpur, Varanasi, Lucknow, Patna and Kolkata all with the population of more than ten lakhs are located along the River Ganga (Fig. 8.13). The wastewater from these towns and industries is discharged into the rivers. This leads to the pollution of the rivers.

Do you know?

To conserve the river ganga, 'Namami' ganga Programme has been initiated.

All the four ways of transport are well developed in the Ganga-Brahmaputra basin. In the plain areas the roadways and railways transport the people from one place to another. The waterways, is an effective means of transport particularly along the rivers. Kolkata is an important port on the River Hooghly. The plain area also has a large number of airports.



Fig. 8.14: Tiger in Manas Wildlife sanctuary

Tourism is another important activity of the basin. Taj Mahal on the banks of River Yamuna in Agra, Allahabad on the confluence of the Rivers Ganga and Yamuna, Buddhists stupas in Uttar Pradesh and Bihar, Lucknow with its Imambara, Assam with Kaziranga and Manas with wild life sanctuaries and Arunachal Pradesh with a distinct tribal culture are some of the places worth a visit (Fig. 8.14).



1. Answer the following questions.

(i) Name the continent in which the Amazon Basin is located.

(ii) What are the crops grown by the people of the Amazon Basin.

(iii) Name the birds that you are likely to find in the rainforests of the Amazon.

(iv) What are the major cities located on the River Ganga.

(v) Where is the one-horned rhinoceros found?

2. Tick the correct answer.

(i) Toucans are a type of
(a) birds (b) animals (c) crops

(ii) Manioc is the staple food of
(a) Ganga Basin (b) Africa (c) Amazon

(iii) Kolkata is located on the river
(a) Orange (b) Hooghly (c) Bhagirathi

(iv) Deodars and firs are a type of
(a) Coniferous trees (b) Deciduous trees (c) shrubs

(v) Bengal tiger is found in
(a) mountains (b) delta area (c) Amazon

3. Match the following.

(i) Cotton textile	(a) Assam
(ii) Maloca	(b) Terrace farming
(iii) Piranha	(c) Sericulture
(iv) Silk worm	(d) Slanting roof
(v) Kaziranga	(e) Ganga plain
	(f) Varanasi
	(g) Fish

4. Give reasons.

(i) The rainforests are depleting.

(ii) Paddy is grown in the Ganga-Brahmaputra plains.

5. Map skills.

(i) On an outline map of the Indian Sub-continent, draw the rivers Ganga and Brahmaputra from the source to the mouth. Also show the important tributaries of both the rivers.

(ii) On the political map of South America, draw the equator. Mark the countries through which the equator passes.

6. For fun.

Make a collage to show places of attractions in India. You can divide the class in different groups to show attractions based on mountain landscapes, coastal beaches, wildlife sanctuaries and places of historical importance.

7. Activity.

Collect under mentioned material and observe how destruction of trees effect the soil cover.

Material

(i) Three small flowerpots or food cans (e.g., cold drinks tin cans),

(ii) one big can with holes punched in the bottom (this will act as a sprinkling can),

(iii) twelve coins or bottle caps

(iv) soil.

Steps

Take three small cans or pots. Fill them with soil till the top. Press the soil to make it level with the top of the can. Now put four coins or bottle caps on the soil of each can. Take the big can that has been punched with holes and fill it with water. You can also take the sprinkling can from your garden. Now, sprinkle water on the three cans. On the first can sprinkle water very slowly so that no soil splashes out. Let moderate amount of water be sprinkled on the second can. On the third can, sprinkle the water heavily. You will observe that unprotected soil splashes out. Where the 'rain' is heavy the amount of soil that splashes out is the maximum and least in case of the first can. The coins or caps represent the tree covers. It is clear that if the land is cleared completely of the vegetation, the soil cover will quickly disappear.



9 Life in the Deserts

0762CH09

In Chapter 5, you have seen that water means life to plants, animals and people. It is difficult for anyone to live in places where there is no water to drink, where there is no grass for their cattle to feed on and where there is no water to help the crops to grow.

We will now learn about the places in the world where people have learned to cope with extreme harsh temperatures; in some places as hot as fire and some as cold as ice. These are the desert areas of the world. These are characterised by low rainfall, scanty vegetation and extreme temperatures. Depending on the temperatures there can be hot deserts or cold deserts. The people inhabit these lands wherever little water is available to practise agriculture.

Glossary

Desert: It is an arid region characteriesed by extremely high or low temperatures and has scarce vegetation.

The Hot Desert – Sahara

Look at the map of the world and the continent of Africa. Locate the Sahara desert covering a large part of North Africa. It is the world's largest desert. It has an area of around 8.54 million sq. km. Do you recall that India has an area of 3.2 million sq. km? The Sahara desert touches eleven countries. These are Algeria, Chad, Egypt, Libya, Mali, Mauritania, Morocco, Niger, Sudan, Tunisia and Western Sahara.



Fig. 9.1: The Sahara Desert

When you think of a desert the picture that immediately comes to your mind is that of sand. But besides the vast stretches of sands, that Sahara desert is covered with, there are also gravel plains and elevated plateaus with bare rocky surface. These rocky surfaces may be more than 2500m high at some places.

Do you know?

You will be surprised to know that present day Sahara once used to be a lush green plain. Cave paintings in Sahara desert show that there used to be rivers with crocodiles. Elephants, lions, giraffes, ostriches, sheep, cattle and goats were common animals. But the change in climate has changed it to a very hot and dry region.



Fig. 9.2: Sahara in Africa

Do you know?

Al Azizia in the Sahara desert, south of Tripoli, Libya recorded the highest temperature of 57.7°C in 1922.

Climate

The climate of the Sahara desert is scorching hot and parch dry. It has a short rainy season. The sky is cloudless and clear. Here, the moisture evaporates faster than it accumulates. Days are unbelievably hot. The temperatures during the day may soar as high as 50°C, heating up the sand and the bare rocks, which in turn radiates heat making everything around hot. The nights may be freezing cold with temperatures nearing zero degrees.

Flora and Fauna

Vegetation in the Sahara desert includes cactus, date palms and acacia. In some places there are oasis – green islands with date palms surrounding them. Camels, hyenas, jackals, foxes, scorpions, many varieties of

snakes and lizards are the prominent animal species living there.



Fig. 9.3: Oasis in the Sahara Desert



Do you know?

Scientists have actually found skeletons of fish in this desert. What could have happened?

People

The Sahara desert despite its harsh climate has been inhabited by various groups of people, who pursue different activities. Among them are the Bedouins and Tuaregs. These groups are nomadic tribes rearing livestock such as goats, sheep, camels and horses. These animals provide them with milk, hides from which they make leather for belts, slippers, water bottles; hair is used for mats, carpets, clothes and blankets. They wear heavy robes as protection against dust storms and hot winds.

The oasis in the Sahara and the Nile Valley in Egypt supports settled population. Since water is available, the people grow date palms. Crops such as rice, wheat, barley and beans are also grown. Egyptian cotton, famous worldwide is grown in Egypt.

The discovery of oil – a product in great demand throughout the world, in Algeria, Libya and Egypt is constantly transforming the Sahara desert. Other minerals of importance that are found in the area include iron, phosphorus, manganese and uranium.

The cultural landscape of the Sahara is undergoing change. Gleaming glass cased office buildings tower over mosques and superhighways crisscross the ancient camel paths. Trucks are replacing camels in the salt trade. Tuaregs are seen acting as guides to foreign tourists. More and more nomadic herdsmen are taking to city life finding jobs in oil and gas operations.



Do you know?

Depressions are formed when the wind blows away the sands. In the depressions where underground water reaches the surface, an oasis is formed. These areas are fertile. People may settle around these water bodies and grow date palms and other crops. Sometimes the oasis may be abnormally large. Tafilalet Oasis in Morocco is a large oasis with an area of about 13,000 sq.km.

Word Origin

Ladakh is made up of two words – "La" meaning 'mountain pass' and "Dak" meaning 'country'

Do you know?

Drass, one of the coldest inhabited places on earth is located in Ladakh.

The Cold Desert - Ladakh

Ladakh is a cold desert lying in the Great Himalayas, on the eastern side of Jammu and Kashmir (Fig. 9.4). The Karakoram Range in the north and the Zanskar mountains in the south enclose it. Several rivers flow through Ladakh, Indus being the most important among them. The rivers form deep valleys and gorges. Several glaciers are found in Ladakh, for example the Gangri glacier.

The altitude in Ladakh varies from about 3000m in Kargil to more than 8,000m in the Karakoram. Due to its high altitude, the climate is extremely cold and dry. The air at this altitude is so thin that the heat of the sun can be felt intensely. The day temperatures in summer are just above zero degree and the night temperatures well below –30°C. It is freezing cold in the winters when the temperatures may remain below –40°C for most of the time. As it lies

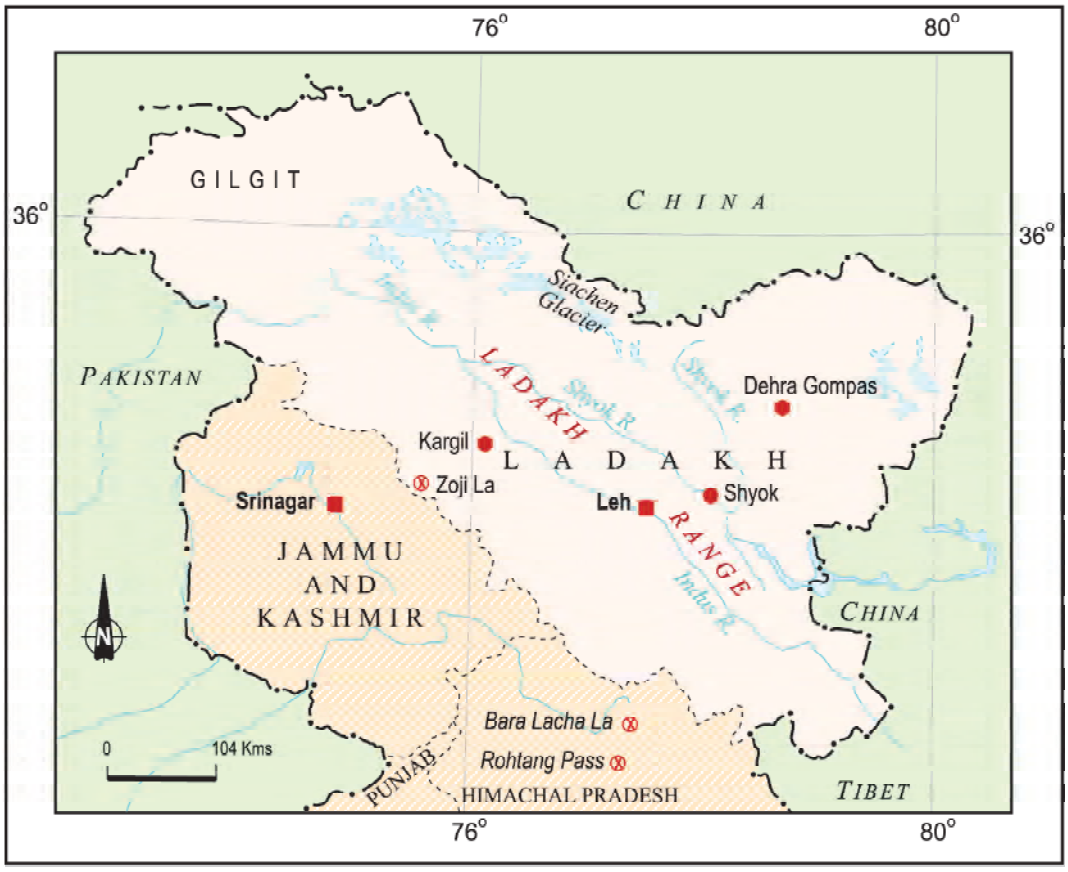


Fig. 9.4: Ladakh

in the rain shadow of the Himalayas, there is little rainfall, as low as 10 cm every year. The area experiences freezing winds and burning hot sunlight. You will be surprised to know that if you sit in the sun with your feet in the shade, you may suffer from both sunstroke and frost bite at the same time.

Do you know?

Ladakh is also known as Khapa-chan which means snow land.

Flora and Fauna

Due to high aridity, the vegetation is sparse. There are scanty patches of grasses and shrubs for animals to graze. Groves of willows and poplars are seen in the valleys. During the summers, fruit trees such as apples, apricots and walnuts bloom. Several species of birds are sighted in Ladakh. Robins, redstarts, Tibetan snowcock, raven and hoopoe are common. Some of these are migratory birds. The animals of Ladakh are wild goats, wild sheep, yak and special kinds of dogs. The animals are reared to provide for the milk, meat and hides. Yak's milk is used to make cheese and butter. The hair of the sheep and goat is used to make woollens.

Do you know?

The Chiru or the Tibetan antelope is an endangered species. It is hunted for its wool known as *shahtoosh*, which is light in weight and extremely warm.

People

Do you find any resemblance between the people of Ladakh and the inhabitants of Tibet and Central Asia? The people here are either Muslims or Buddhists. In fact several Buddhists monasteries dot the Ladakhi landscape with their traditional 'gompas'. Some famous monasteries are Hemis, Thiksey, Shey and Lamayuru (Fig. 9.5).

Do you know?

The finest cricket bats are made from the wood of the willow trees.

In the summer season the people are busy cultivating barley, potatoes, peas, beans and turnip. The climate in winter months is so harsh that people keep themselves engaged in festivities and ceremonies. The women are very hard working. They work not only in the house and fields, but also manage small business and shops. Leh, the capital of Ladakh is well connected both by road and air. The National Highway 1A connects Leh to Kashmir Valley through the Zoji la Pass. Can you name some more passes in the Himalayas?



Fig. 9.5: Thiksey Monastery



Manali - Leh highway crosses four passes, Rohtang la, Baralacha la Lungalacha la and Tanglang la. The highway opens only between July and September when snow is cleared from the road.



Baralacha la

Tourism is a major activity with several tourists streaming in from within India and abroad. Visits to the gompas, treks to see the meadows and glaciers, witnessing ceremonies and festivities are important activities.



Fig. 9.6: Ladakhi Women in Traditional Dress

Life of people is undergoing change due to modernisation. But the people of Ladakh have over the centuries learned to live in balance and harmony with nature. Due to scarcity of resources like water and fuel, they are used with reverence and care. Nothing is discarded or wasted.



1. Answer the following questions.
   (a) What are the two types of deserts found in the world?
   (b) In which continent is the Sahara desert located?
   (c) What are the climatic conditions of the Ladakh desert?
   (d) What mainly attracts tourists to Ladakh?
   (e) What type of clothes the people of the Sahara desert wear?
   (f) Name the trees that grow in Ladakh.

2. Tick the correct answer.
   (i) Sahara is located in which part of Africa
   (a) eastern (b) northern (c) western
   (ii) Sahara is what type of desert
   (a) cold (b) hot (c) mild
   (iii) The Ladakh desert is mainly inhabited by
   (a) Christians and Muslims
   (b) Buddhists and Muslims
   (c) Christians and Buddhists
   (iv) Deserts are characterised by
   (a) scanty vegetation
   (b) heavy precipitation
   (c) low evaporation

(v) Hemis in the Ladakh is a famous
(a) temple (b) church (c) monastery

(vi) Egypt is famous for growing
(a) wheat (b) maize (c) cotton

3. Match the following.

(i) Oasis	(a) Libya
(ii) Bedouins	(b) monastery
(iii) Oil	(c) glacier
(iv) Gangri	(d) depressions with water
(v) Lamayuru	(e) cold desert
	(f) Sahara

4. Give reasons.

(i) There is scanty vegetation in the deserts.

(ii) People of the Sahara desert wear heavy robes.

5. Map skills.

(i) On the outline map of Africa, mark the Sahara desert and any four countries around it.

(ii) On the outline map of India, mark the Karakoram Range, Zanskar Range, Ladakh and Zoji La pass.

6. For fun.

Desert Game

This is a class room activity involving all the students. The teacher will create a list of desert creatures. The number of the creatures should be same as the number of students in the class. The creatures can be picked up from the categories of mammals, birds and reptiles. Mammals can include – camel, yak, fox, sheep, goat, antelope...
Birds – raven, eagle, vulture, turkey...
Reptiles – snakes ...

Assign one desert creature to each student. Ask the student to write three characteristics of the creature on plain sheet of paper. (students can use index cards of size 10 cm × 15 cm). Questions such as - in what type of deserts it is found? Major adaptation? Use to man?

These characteristics will be used as clues in the guessing game. On the board make three columns – mammals, birs and reptiles. Paste a sheet of paper in the column under the particular category. The class can be divided in three to four groups. They will compete against each other in the 'desert game'. Each group now takes turn in guessing the correct answer. Explain to the class that they have to guess what animal matches the characteristics listed on the paper.
For example:

- Animal of hot desert
- Has double set of eyelashes to keep away the sand
- The hide is used for making water bottles

The correct answer is 'camel'. Within the group there will be a student who has prepared the card. That student should not answer. Ten points are awarded for the correct answer.

This game will enable students to understand the desert. You can play the same game by taking different types of fruits, flora and the clothes the people wear.

Some Internet Sources for More Information

http://school.discovery.com/

http://nationalgeographic.com/

http://www.incredibleindia.org/

http://www.wikipedia.org/

http://www.greenpeace.org/

http://www.britannica.com/

http;//www.animalplanet.co.uk/