GEOGRAPHY

FOR

CLASS 6

PUNJAB CURRICULUM AND TEXTBOOK BOARD, LAHORE

Approved by Federal Ministry of Education (Curriculum Wing), Islamabad according to National Curriculum 2006 and National Textbook & Learning Material Policy 2007
NOC No. F.1-17/2010-Geography dated 07-12-2010

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Published by: Punjab Textbook Board Employees Welfare Society, Lahore

Printed by:

Date of Printing	Edition	Impression	No. of Copies	Price

بِسۡمِ اللّٰہِ الرَّحۡمٰنِ الرَّحِیۡمِ ○

ترجمہ: "شروع اللہ کے نام سے جو بڑا مہربان نہایت رحم والا ہے۔"

CHAPTER 1

EARTH AS A PLANET

Learning Outcomes

After studying this chapter, students will be able to:

- describe the universe and its components.
- recognize the Sun as a star and source of energy for planets.
- list other members of the solar system and describe their movements.
- describe the shape and size of the Earth.
- explain the rotation of the Earth on its axis and formation of days and nights.
- explain the revolution of the Earth and describe how seasons change.
- describe the seasonal variation in the two hemispheres (southern and northern) at a time.
- describe the phenomena of Solar and Lunar Eclipses.
- draw a diagram of Solar and Lunar Eclipses.
- label the continents and the oceans on the given world map.
- describe the continents and oceans.

A. Universe and its Components

Universe

According to the scientists, the creation of universe resulted from a massive explosion about 15 to 20 billion years ago. This is called Big Bang.

The universe is a combination of billions of galaxies comprised of matter. The Milky Way Galaxy is one of these. It is a collection of billions of stars, gases and clouds of dust.

Milky Way Galaxy

Solar System

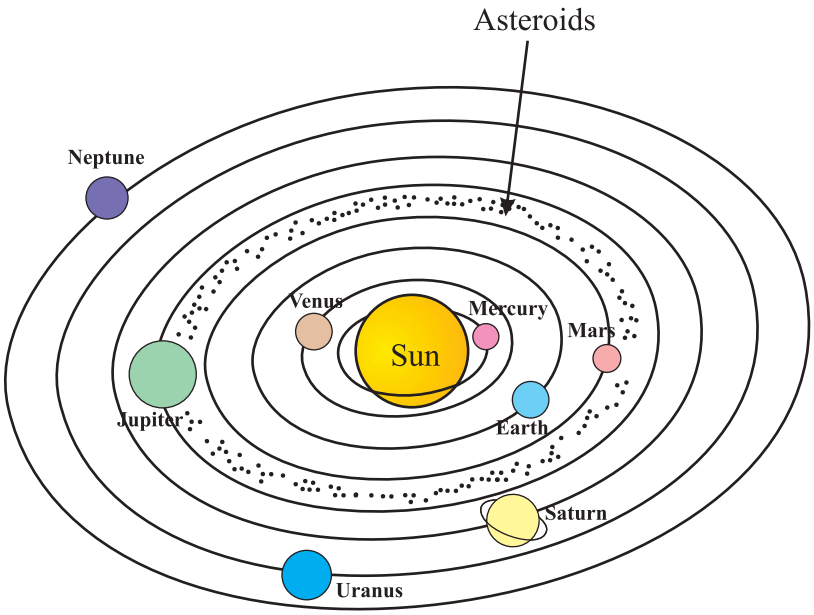
According to astronomers, the Sun is one of the billions of stars of the Milky Way Galaxy. Eight planets revolve around the Sun. This is called solar system.

Our Earth is part of the solar system. It is one of the eight planets which revolve around the Sun in their respective orbits.

Earth

B. Solar System and Earth

The solar system is composed of eight planets which revolve around the Sun in their respective orbits. This system originated about 5 billion years ago when a cloud of gases and dust began to spin. This gaseous material began to cool with the passage of time and appeared in the shape of solar system. In the centre, originated the Sun while the circulating gases and dust became planets which began to revolve around the Sun.



Solar system

Sun

Sun is a bright star. It is comprised of hydrogen and helium gases. The temperature of its outer surface is about 6000° centigrade. It is a source of temperature and light for all the planets of the solar system.

Planets

The planets which revolve around the Sun in their respective orbits, get light and temperature from the Sun. Our Earth is one of these planets which revolves around the Sun in 365 days and 6 hours.

Interesting Information

Do you know that these 6 hours after 4 years become 24 hours due to which a day is added in the month of February. This is called "The Leap Year". i.e. ....., February 2016, 2020, ...

Let us see the period other planets take to revolve around the Sun.

Planets	Distance from the Sun (Million kilometres)	Period of revolution around the sun
Mercury	58	88 days
Venus	108	225 days
Earth	150	365 days (One year)
Mars	228	2 years
Jupiter	778	12 years
Saturn	1430	30 years
Uranus	2870	84 years
Neptune	4500	165 years

Do you know?

The 9th planet of the solar system "Pluto" was eliminated from the list of planets in August 2006.

Note: Distances are shown in round figures.

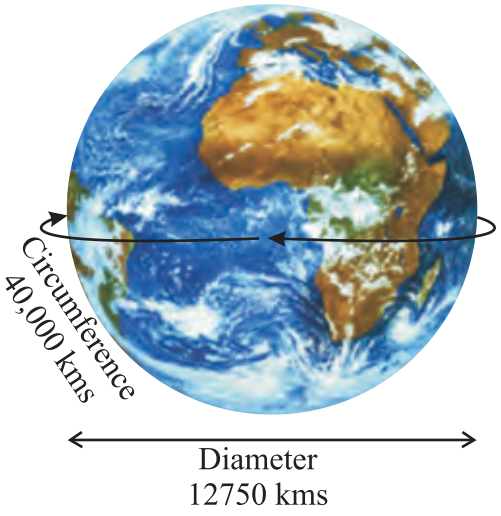
C. Shape and Size of Earth

Shape of Earth

Earth is round like a football. If we travel in any direction on Earth, we shall reach the same place from where we started our journey. In ancient times, the people experimented and learned that the Earth was round. In present age, the pictures of Earth taken from satellites have made it easy to understand what is the shape of Earth.

Size of Earth

- If we cut the Earth along the equator into two equal halves, the distance from one end to the other is about 12750 kilometres. This is the diameter of the Earth.
- If we move along the equator and take a complete round, the distance is about 40,000 kilometres. This is the circumference of the Earth.
- The area of the surface of Earth is about 510 million square kilometres.



Shape and Size of Earth

D. Movement of Earth

The Earth takes two types of movements at the same time.

i. Rotation ii. Revolution

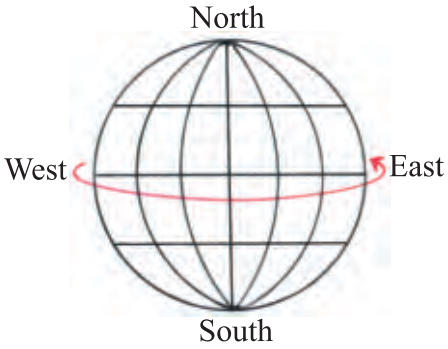
i. Rotation

The Earth moves around its axis. This is called rotation. The characteristics of this movement are:

- The movement is from west to east.
- The speed of this movement is about 1700 kms per hour.
- The Earth takes a complete rotation around its axis in 24 hours.
- Days and nights are formed as a result of this movement.

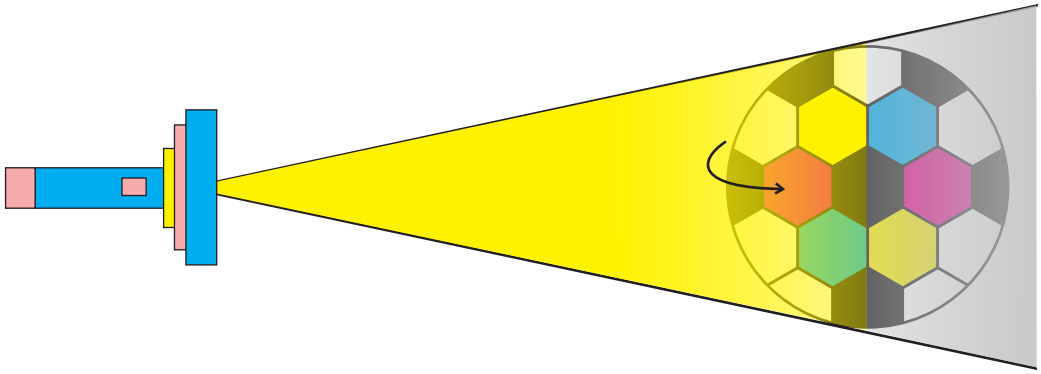
Interesting Information

Earth is somewhat flat on the poles. That is why the Earth's polar diameter and circumference is less than equatorial diameter and circumference.



Formation of Day and Night

If a football is hanged with a string and light is thrown on it with a torch from a distance of 5 feet, you will see that half portion of football is illuminated and the other half is in darkness. Mark the half portion.



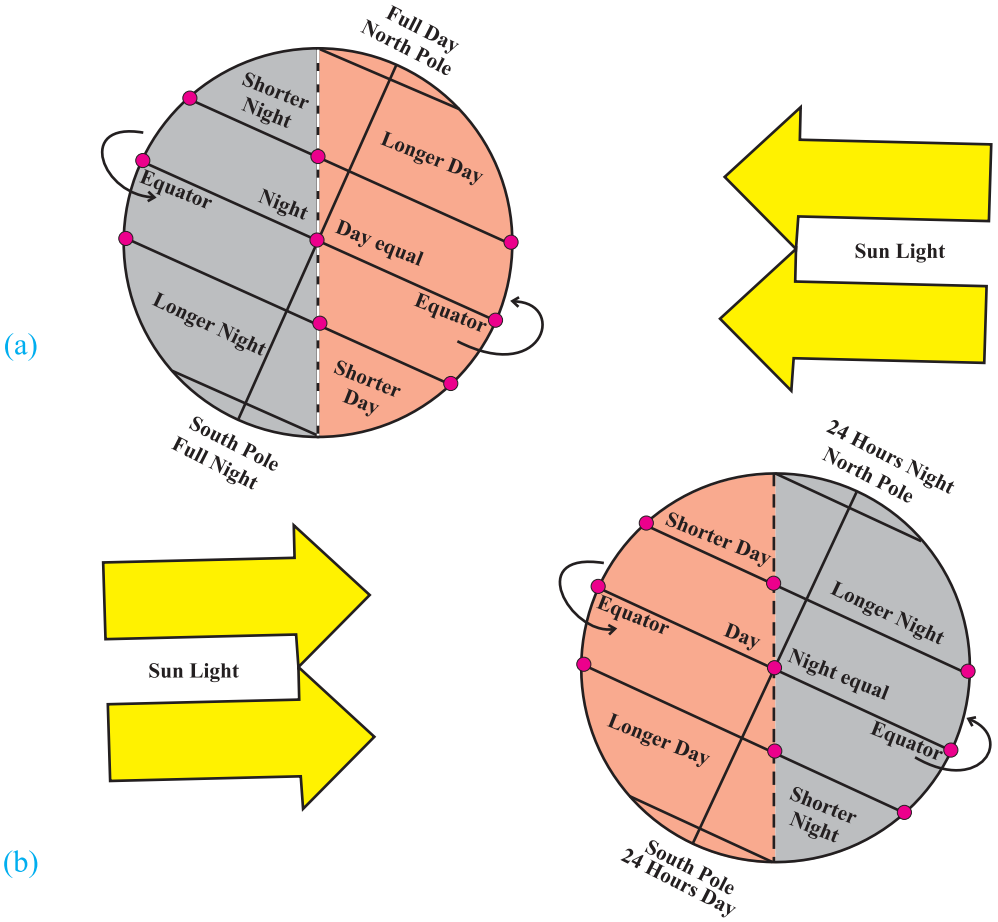
Now if you rotate the football slowly, you will see that the portion which was in darkness has come into light and the portion which was illuminated has gone into darkness.

Days and nights are formed in the same way. Because the Earth is round like a football, its half portion remains in front of the Sun for a specific time. This half portion experiences day while the other half portion experiences night. Due to rotation, the day and night are constantly interchanged.

Change in the Length of Days and Nights

The Earth's axis is tilted at an angle of 66 ½°. Due to this tilt, the length of day and night changes. The days are longer in the portion which is tilted towards the Sun and the days are shorter in the portion which is tilted away from the Sun. In the north of equator when days are longer and nights are shorter, the days are shorter and nights are longer in the south of equator at the same time. In the same way, when days are shorter and nights are longer in the north of equator, the days are longer and nights are shorter in the south of equator.

Think! If the axis of the Earh is considered to be straight, would there by any difference in the length of day and night?

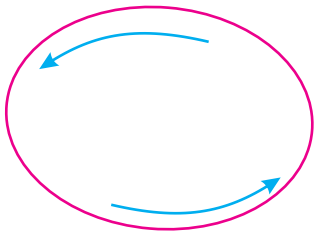


Tilt of axis and length of days and nights

ii. Revolution

The movement of the Earth in its orbit around the Sun is called revolution. The characteristics of this movement are:

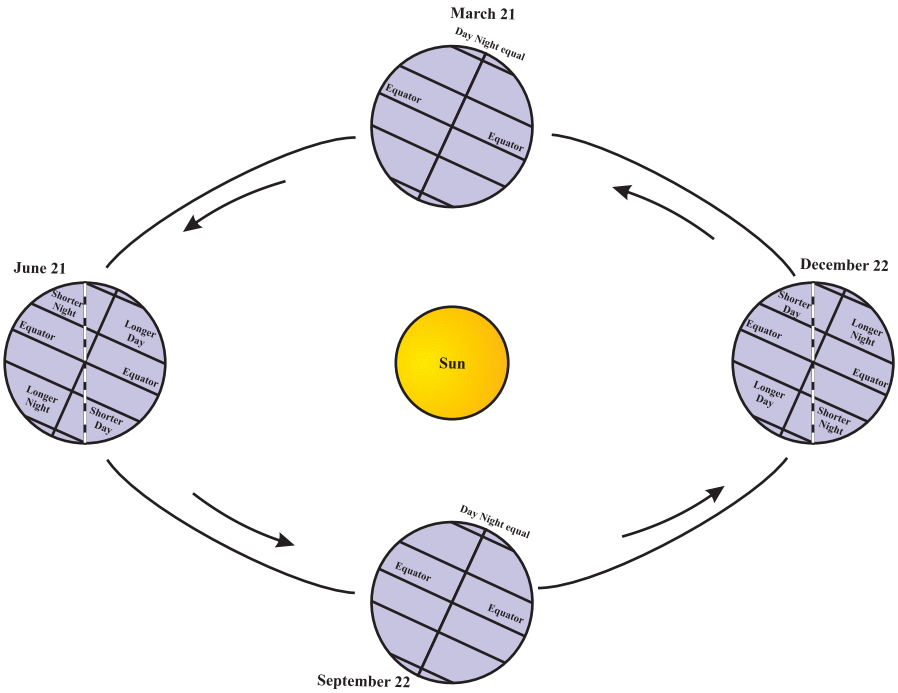
- The movement is anticlockwise.
- The speed of this movement is about 107,000 kilometres per hour.
- The Earth completes a revolution in its orbit in about 365 days and 6 hours.
- Seasons are formed by this movement.
- The orbit in which the Earth revolves is oval in shape.



Anticlockwise movement

Seasons

The seasons are formed due to the tilt of the Earth's axis. In summers the days are longer and nights are shorter and in winters the days are shorter and nights are longer.



Revolution and Seasons

Seasonal Variation in the Northern and the Southern Hemispheres

- On June 21, the northern hemisphere is tilted towards the Sun, while the southern hemisphere is away from the Sun. That's why there is summer in the northern hemisphere and winter in the southern hemisphere.
- On December 22, the southern hemisphere is tilted towards the Sun, while the northern hemisphere is away from the Sun. That is why there is summer in the southern hemisphere and winter in the northern hemisphere.
- On March 21 and September 22, neither of the two hemispheres is tilted towards the Sun. That's why the season is neither too hot nor too

cold in both hemispheres.

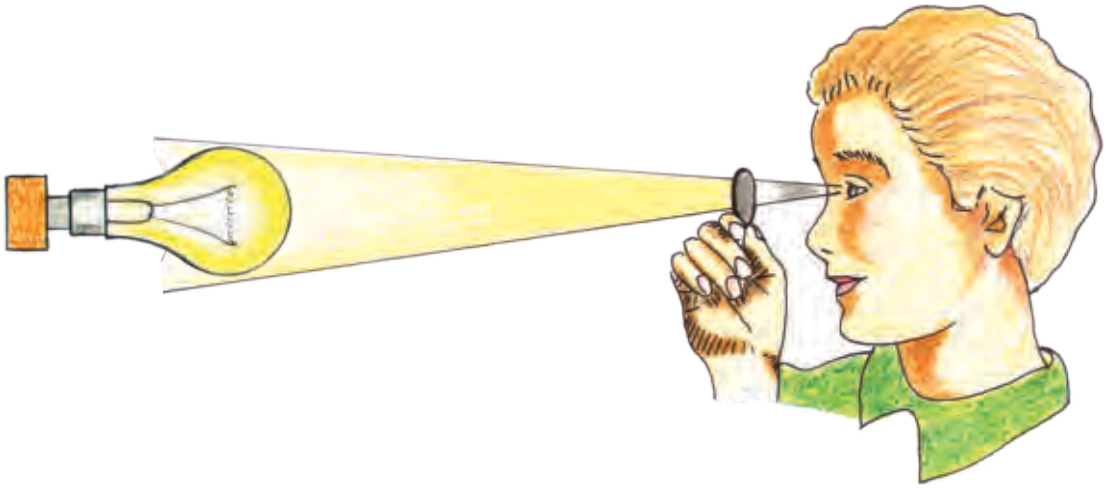
E. Solar and Lunar Eclipses

The Earth revolves around the sun and the Moon revolves around the Earth. During the revolution it happens that:

- sometimes the Moon comes between the Sun and the Earth and casts its shadow on the Earth, due to which the Sun is not seen completely or partially from the Earth. This is called Solar eclipse.
- sometimes the Earth comes between the Sun and the moon and casts its shadow on the Moon, due to which the Moon is not seen completely or partially from the Earth. This is called Lunar eclipse.

Lets take an example:

Light a bulb and watch it with one eye closed. Now take a coin in your hand and bring it near the eye in such a way that the coin comes between the eye and the bulb. Now see that:

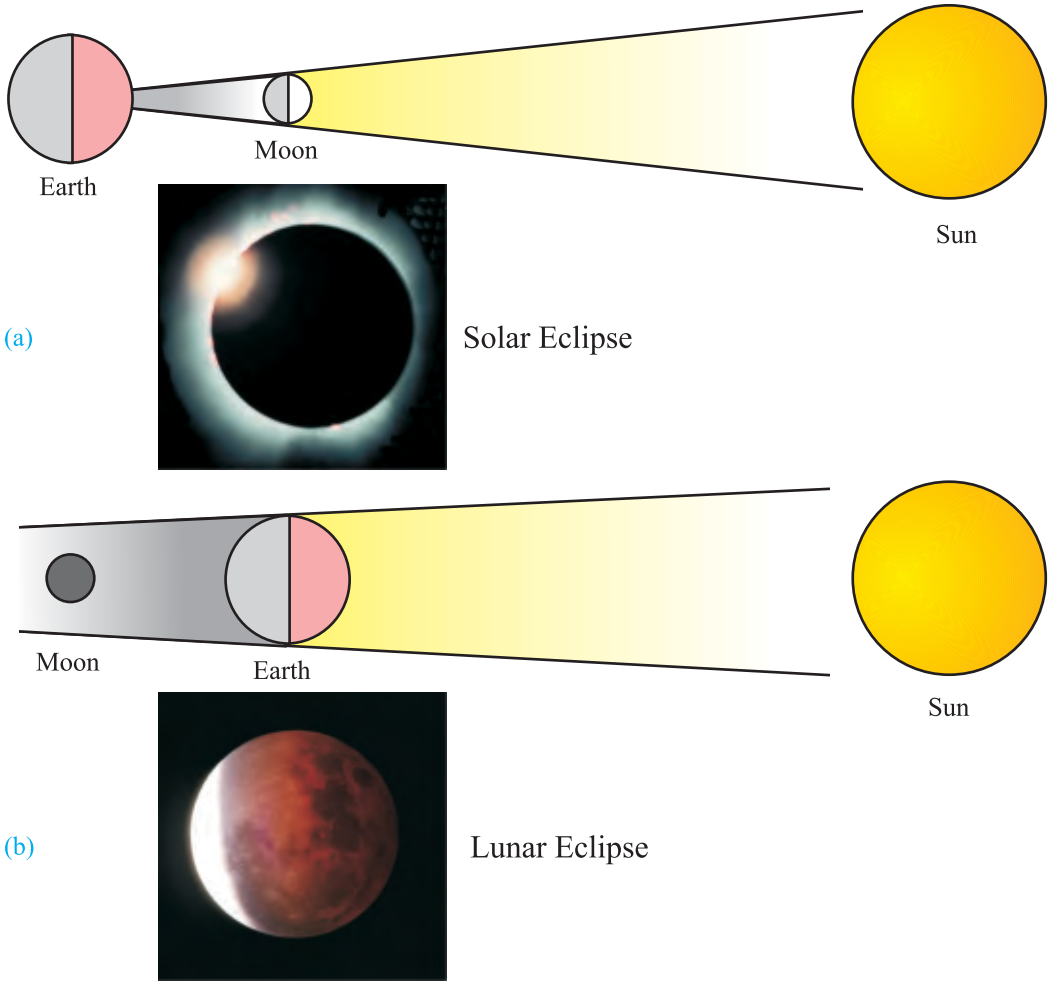


i. Is the bulb being seen?

ii. Is the light of the bulb falling on your eye?

Solar and lunar eclipses occur in the same way.

Think! Does the Sun come between the Earth and the Moon?



Solar and Lunar Eclipses

F. Continents and Oceans

The area of the Earth's surface is about 510 million sq. kms, out of which about 29% is comprised of land and 71% is covered by water.

Continents

The land portion is comprised of seven large masses which are called continents. These are:

i. Asia

It is the largest continent. In its east lies the Pacific Ocean, in the west is Europe, in the north is the Northern Ocean and in the south is the Indian

ii. Africa

It is the second largest continent. In its east lies the Indian ocean, in the west is the Atlantic Ocean, in the north is the Mediterranean Sea and in the south is the Southern ocean.

iii. North America

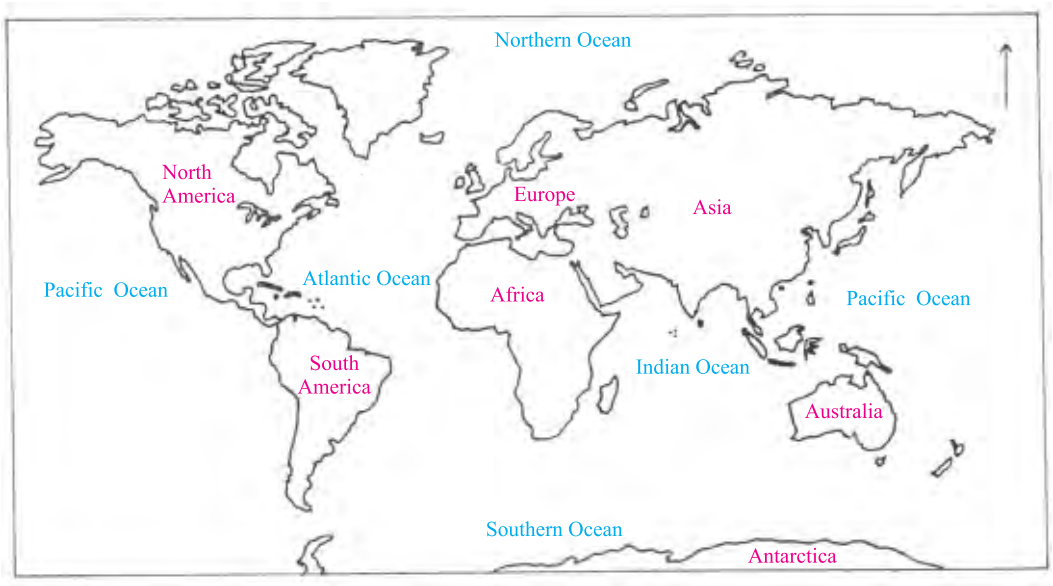
It is the third largest continent. In its east lies the Atlantic Ocean, in the west is the Pacific Ocean, in the north is the Northern ocean and in the south is the continent of South America.

iv. South America

It is the fourth largest continent. In its east lies the Atlantic Ocean, in the west is the Pacific Ocean, in the north is the continent of North America and in the south is the Southern Ocean.

v. Antarctica

It is the fifth largest continent. It is situated around the south pole. Due to its extreme cold climate, it is the only uninhabited continent.



Continents and Oceans

vi. Europe

It is the sixth largest continent. In its east lies Asia, in the west is the Atlantic Ocean, in the north is the Northern Ocean and in the south is the Mediterranean Sea.

vii. Australia

It is the smallest continent. In its east and north lies the Pacific ocean, in the west and south lies the Indian Ocean.

Oceans

A huge mass of water is called ocean. There are five oceans in the world. These are:

i. Pacific Ocean

It is the largest ocean. In its east are the continents of North and South America and in the west are Asia and Australia.

ii. Atlantic Ocean

It is the second largest ocean. In its east are the continents of Europe and Africa and in the west are North and South America.

iii. Indian Ocean

It is the third largest ocean. In its east lies the continent of Australia, in the west is Africa, in the north is Asia and in the south is the Southern ocean.

iv. Southern Ocean

It is the fourth largest ocean. It is situated around the south pole. It is extremely cold.

v. Northern Ocean

It is the smallest ocean. It is situated around the north pole. It is also extremely cold.

Interesting Information

In the northern hemisphere the area of land is more than the area of oceans, while the area of oceans is more than the area of land in the southern hemisphere.

KEY POINTS

1. The universe is a combination of billions of galaxies comprised of matter.
2. Earth, solar system and galaxies are important components of the universe.
3. Sun is a star around which revolve the planets.
4. Earth is round, the surface area of Earth is about 510 million sq. kms.
5. Day and night are formed by rotation and seasons are formed by revolution.
6. When the Moon comes between the Earth and the Sun, there is a Solar eclipse.
7. When the Earth comes between the Sun and the Moon, there is a Lunar eclipse.
8. There are seven continents and five oceans on the Earth.

GLOSSARY

1 Million	:	10,00,000
1 Billion	:	1000,000,000
Solar System	:	The system of eight planets revolving around the Sun.
Galaxy	:	The combination of billions of stars, gases and clouds of dust in which our solar system exists.
Rotation	:	The movement of Earth about its axis.
Revolution	:	The movement of Earth in its orbit around the Sun.
Leap year	:	The year in which there are 366 days comes after every four years.

QUESTIONS

1. Tick (✓) the correct answer:

i. Sun is a:

a. planet b. star
c. satellite d. galaxy

ii. The largest continent is:

a. Africa b. Europe
c. North America d. Asia

iii. The diameter of Earth in kilometres is:

a. 4000 b. 6375
c. 8870 d. 12750

iv. The circumference of Earth in kilometres is:

a. 40,000 b. 30,000
c. 25,000 d. 15,000

v. The area of Earth surface in million sq. kms is:

a. 148 b. 362
c. 510 d. 700

vi. The Earth completes a rotation about its axis in:

a. 1 year b. 1 hour
c. 72 days d. 24 hours

vii. The Earth completes a revolution around its orbit in:

a. 24 hours b. 1 year
c. 2 years d. 12 years

viii. The percentage of Earth surface covered by water is:

a. 29 b. 50
c. 71 d. 90

ix. The ocean in the east of Asia is:

a. Atlantic b. Pacific
c. Indian d. Arctic

x. The uninhabited continent is:

a. Australia b. Europe

c. Asia d. Antarctica

2. Give short answers:

i. What is meant by universe?

ii. Name the planets of the Solar system.

iii. What is the size of the Earth?

iv. How does Lunar and Solar eclipses occur?

v. Name the continents and oceans of the world.

3. Define Rotation and the formation of day and night.

4. Define Revolution of the Earth and the change of seasons.

5. Write a note on the Continents.

CHAPTER 2

GLOBE, MAPS AND THEIR USES

Learning Outcomes

After studying this chapter, students will be able to:

- recognize globe as a model of Earth.
- define a map and state its importance.
- identify the cardinal points on a given map and different types of north.
- identify directions with reference to a specific location on a map.
- explain the concept of scale and its types.
- measure the distance between two points on a map using a map scale.
- define latitudes and longitudes.
- identify important latitudes and longitudes.
- find the location of place on a map using latitudes and longitudes.
- calculate the time difference between two places with the help of longitudes.
- recognize different types of map symbols on a map.
- list the symbols
- identify the physical and man made features on a map with the help of conventional signs.
- describe the utility of a map and Atlas in everyday life.

Globe

If we draw an accurate map of Earth on a round body like a football, it will become a model of the Earth. It is called globe.

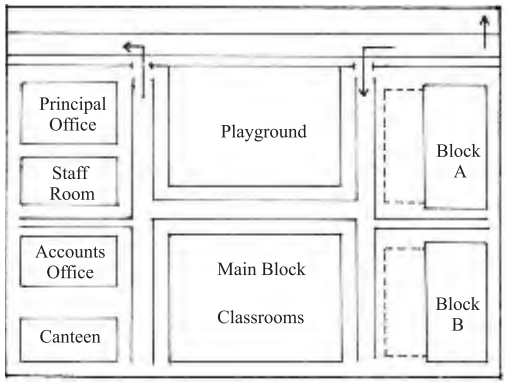
(a) Earth

(b) Model of Earth .....! Globe

Map

Map is a representation of the whole Earth or part of it on a flat surface (paper) according to a given scale.

It just seems as you are looking at that place from a height overhead.



This is a map of a school. It is called plan. 1 cm on map is representing 100 metres on the ground.

Difference Between Globe and Map

The basic difference between a globe and a map is that:

- globe is round and map is flat.
- globe represents the whole Earth while map can represent a small portion of Earth as well.
- globe cannot represent much details, on the other hand every type of detail can be shown on a map.

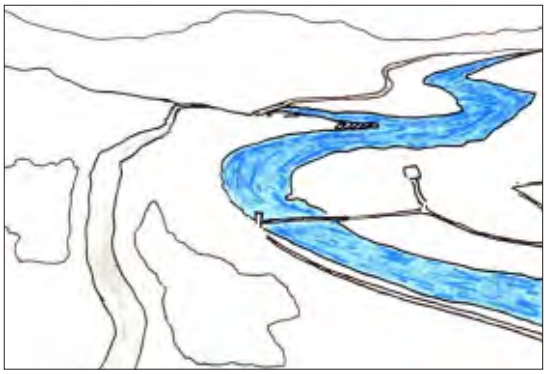
A. Importance of a Map

Our Earth is a big place. What is its shape? Where do we live on it? What type of place is that where we live? What type of places are situated around us? And what type of connection we have with our surrounding places?

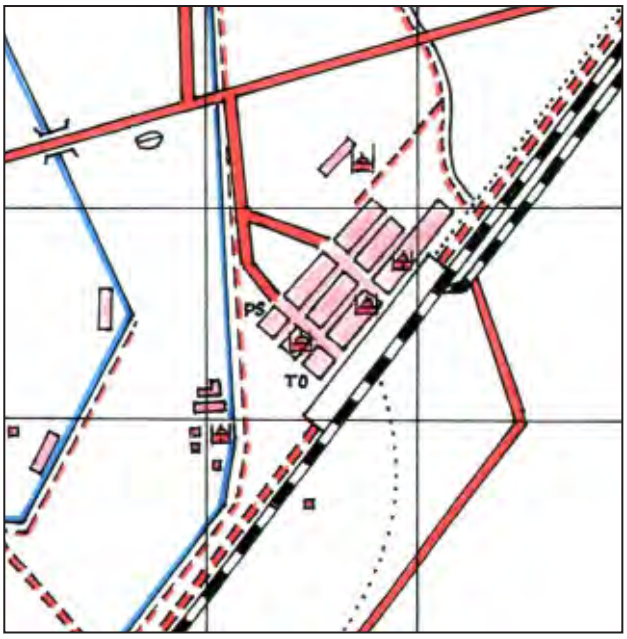
To answer such type of questions, we need a map.

What are maps and how they are prepared? To understand, lets have a look on some models given below:

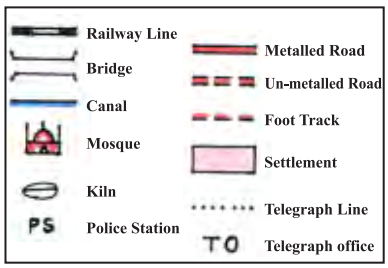
This is a picture of Muzaffarabad city where two rivers Neelum and Jhelum are combining.

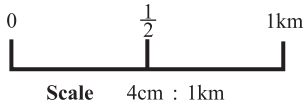


This is sketch map of the same picture. It is the simplest type of map which can be drawn without scale.



Conventional Signs





This is a map prepared according to scale and direction in which conventional signs have also been used.

Activity

Draw a sketch map of the picture taken from satellite.

Picture taken from Satellite

Do you know?

These days maps are prepared on the basis of pictures taken from aeroplanes and satellites. In the past, position of Sun and stars was considered.

B. Components of Map

You have seen pictures as well as maps.

Think! What is the difference between them?

Following characteristics are found in a map which a picture can not show.

1. Map shows direction.
2. Map has a scale.
3. Latitudes and longitudes are drawn on a map.
4. Landforms are shown by conventional signs on a map.

Let us have a detailed look on these components.

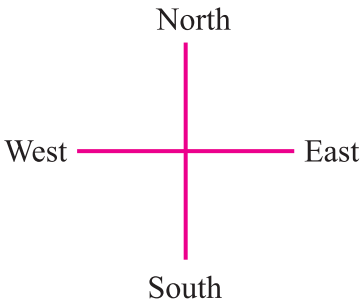
Do you know?

The network of latitudes and longitudes on which a map is drawn is called Projection.

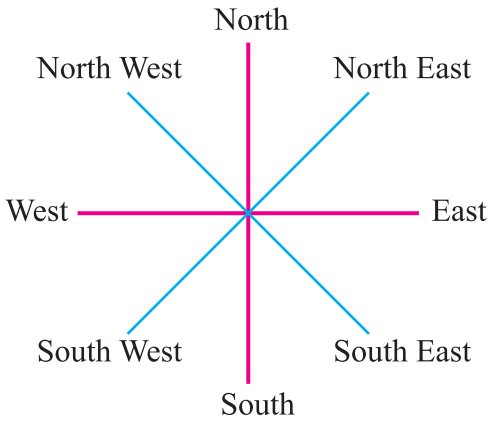
1. Directions

Sun rises in the east and sets in the west. If you stand facing east, then on your right is south, left is north and on your back is west.

Maps are drawn on the basis of directions. East, West, North and South are primary directions. These are called cardinal points. There are four more directions between the cardinal points. These are called secondary directions. Directions help us to find on which side a place is situated with reference to the other.



(a) Cardinal Points



(b) Secondary Directions:

- North East
- North West
- South East
- South West

Directions

Activity:

Observe the map and answer the following questions:

I. Name the country in the east of Pakistan.

ii. In which direction Arabian sea is situated from Pakistan?

iii. Name the two countries which are situated in the west of Pakistan.

iv. What is the direction of China from Pakistan?

Types of North

The direction of basic importance on the map is north. It is shown by an arrow on the upper side of the map.

North is of two types.

i. Geographic North

The direction in which the north pole is situated, is the geographic north. It can be detected by the Polar star which remains always overhead north pole.

ii. Magnetic North

Our Earth has a magnetic field, and like a magnetic bar it has two ends i.e., magnetic north and magnetic south. Magnetic north can be traced by an instrument known as magnetic compass.

Magnetic Compass

Interesting Information

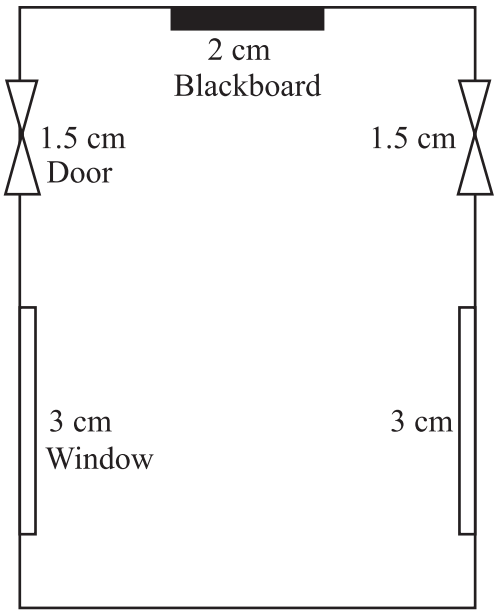
Magnetic north is situated near north pole in the Canadian island of Prince Wales.

2. Scale

Here a plan of classroom is given. Its actual length on ground is 8 metres and width is 6 metres. Can we show the classroom in its actual length and width on this small piece of paper?

"A ratio is established between ground and map distance. This is called scale."

The scale of classroom represents 8 metres on ground by 8 cm on paper. It means that 1 metre on ground is shown by 1cm on the plan.



Classroom Map

Types of Scale

We can show the scale by three methods:

I. As a statement, i.e., 1cm:1 metre.

This is called statement of scale.

ii. As fraction, i.e., 1:100 which means 1cm:100 cm

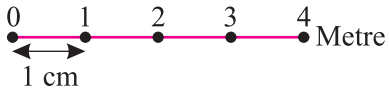
Do you know?

1 metre = 100 centimetres
1 kilometre = 100,000 centrimetres

(1 metre has been converted in 100 cm, so that there are same units for the ratio).

This is called Representative Fraction, commonly known as R.F.

iii. As a horizontal line which shows the ratio between ground and map distance.



This is called Linear Scale.

Measuring Distance

Activity:

I. The scale of plan of classroom (given on previous page) is 1 cm : 1 metre.

Now tell:

What is the actual width of window, door and blackboard?

ii. Here a map of Pakistan is given. The scale is 1 cm : 200 km.

Now tell:

What is the approximate ground distance between:

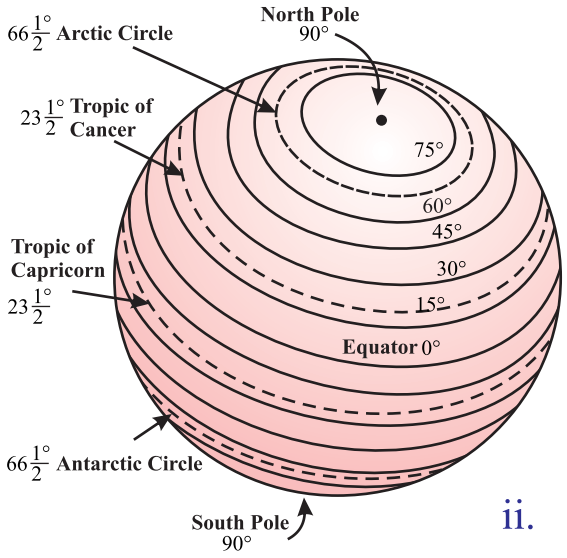
- Peshawar - Islamabad
- Islamabad - Lahore
- Lahore - Karachi

3. Latitude and Longitude

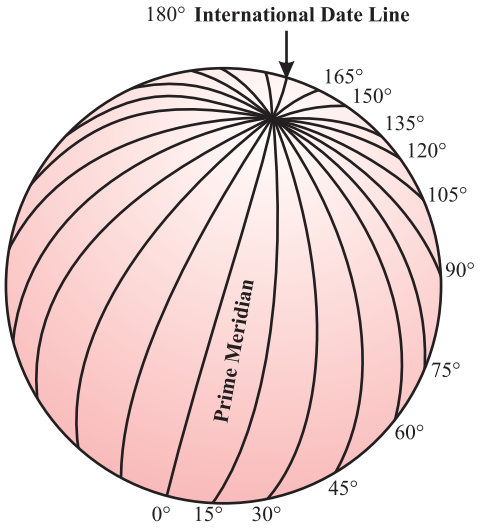
The location of places on Earth is shown by latitude and longitude on a map.

i. Latitude

The line on a map which divides the Earth into northern and southern hemispheres is called equator. The angular measurement of a place taken from equator is shown by lines. These lines are drawn parallel to the equator and are called latitudes.



(a) Important Latitudes



(b) Important Longitudes

Do you know?

There are 180° latitudes from north pole to south pole, 90° in the north of equator and 90° in the south of equator.

ii. Longitude

The line on map which divides the Earth into eastern and western hemispheres is called Prime Meridian. The angular measurement of a place taken from Prime Meridian is shown by lines. These lines join together at north and south poles and are called longitudes.

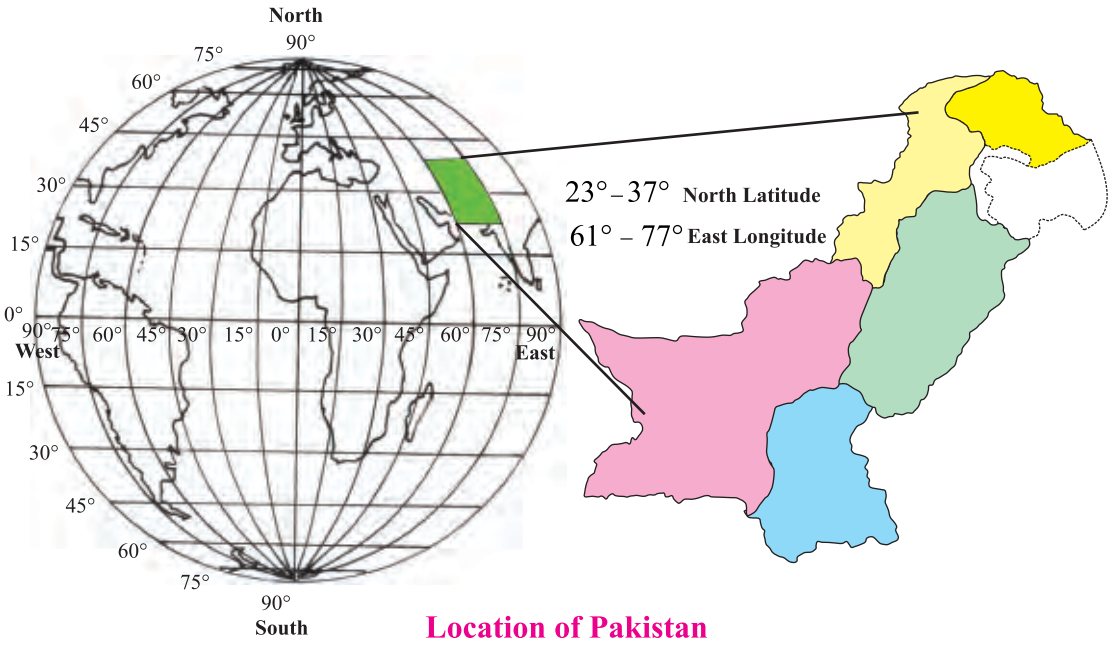
Do you know?

There are 360° longitudes on the globe. 180° in the east of Prime Meridian and 180° in the west of Prime Meridian up to International Date Line.

Location of a Place

Location of a place on a map is found with the help of latitude and longitude. The places with north latitude are searched in the northern hemisphere and places with south latitude are searched in the southern hemisphere. Similarly, the places with east longitude are searched in the east of Prime Meridian and the places with west longitude are searched in the west of Prime Meridian.

Let us discover the location of Pakistan.



Location of Pakistan

Time Zones

We can calculate the time difference between two countries with the help of longitude. There are 360° longitudes which pass in front of the Sun in 24 hours due to rotation of the Earth. The speed is 15° longitudes per hour (Formula $\frac{360}{24} = 15^{\circ}$ longitude per hour). That is why there is a difference of 1 hour after every 15° longitudes. Due to the direction of rotation of the Earth, the time is 1 hour ahead towards east and 1 hour back towards west after every 15° longitudes . Due to difference of time, the world has been divided into zones of 15° longitudes each. These are called Time Zones. The time is the same in each zone.

Interesting Information

International time difference is calculated from the Prime Meridian which is the central longitude. It is also called Greenwich Meridian because it passes on the map through Greenwich, a place in London (UK).

Let us see the procedure of calculating time difference.

Activity:

If time in Greenwich is 12:00 Noon, find the time of Lahore (Pakistan). The longitude of Lahore is 75°E.

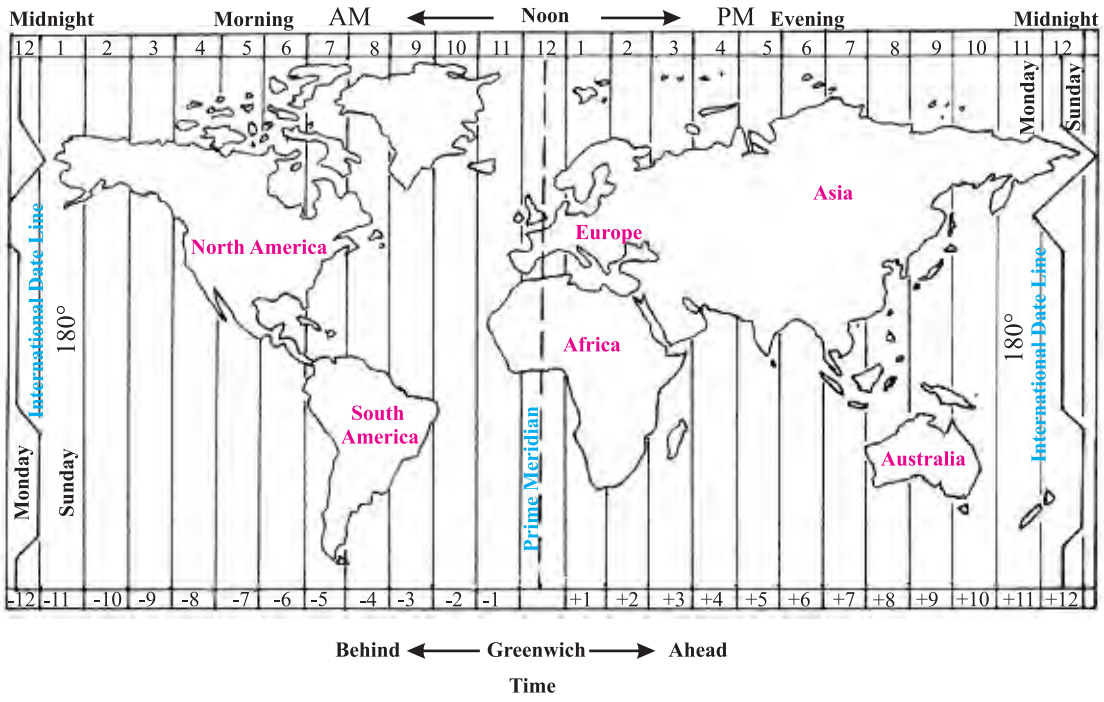
The difference of time between Greenwich and Lahore $= \frac{\text{Longitude of Lahore}}{15}$

$= \frac{75}{15} = 5$ hours

Because Lahore is situated in the east of Greenwich (Prime Meridian), its time would be 5 hours ahead.

So 12:00 + 5 = 17:00 which means 5:00 pm.

(Note: We would subtract the time difference from the Greenwich time, if the place lies in the west of Greenwich.)



Time Zones

International Date Line

If we move towards east from the Prime Meridian then at 180° longitude the time is 12 hours ahead and if we move towards west, then at 180° the time is 12 hours back. So at 180° longitude the time difference is exactly 24 hours. That is why 180° longitude has been designated as

International Date Line. If we cross the date line from east to west then we are a full day ahead and if we cross from west to east we are a full day back.

4. Symbols

The physical and cultural landforms on the surface of Earth are shown by symbols on the map. These are called conventional signs.

Activity:

Observe the given picture and the map on the next page. Landforms found on the surface of Earth have been shown by different symbols on the map.

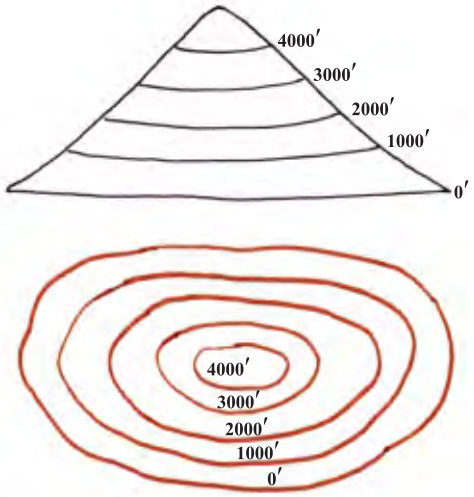
Think! Which landforms are physical and which ones have been made by man?

C. Methods of Showing Relief on a Map

Landforms on the Earth's surface can be shown on a map by different methods. Let us have a look on some of these methods.

1. Contours

Contours are drawn to show altitude on the map. "These are lines on the map which join areas of equal height from the sea-level".



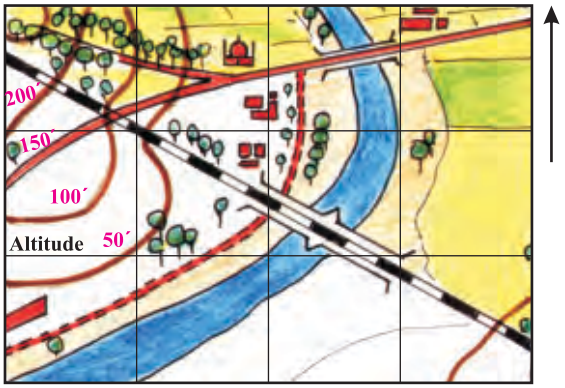
Contours

2. Layer Tints

Different areas are shown by different colour layers e.g. plains and forests are shown by different shades of green colour, mountains by brown and snowy areas by white colour.

Layers Tints

(a) Picture



(b) Map

0 100 200 metres

Church
Masjid
Spring
Well
PS Police Station
PO Post Office
Grass
Gardens
International Boundary

Symbols

Railway Line
Metalled Road
Un-metalled Road
Bridge
Railway Bridge
100´ 50´ Contours
Trees
Cultivated area
River
Settlement

3. Conventional Signs

You have studied that physical and cultural landforms on Earth are shown by symbols on a map. These are called conventional signs.

D. Uses of Maps

1. Maps tell us where we live on the Earth.
2. A map tells us about direction.
3. We need a map for tourism.
4. The scale of a map helps us to understand ground distances.
5. Maps keep us in touch with different parts of the world.
6. Maps help us to understand different environments found in the world.
7. War planning is done on the maps.
8. Maps are an important source to show distribution of crops, minerals and industries.
9. Weather conditions are shown with the help of maps.
10. Maps provide guidance for land, water and air travel.

Do you know?

The collection of maps in shape of a book is called Atlas.

KEY POINTS

1. A map is a presentation of Earth or part of it on a flat surface.
2. North is of primary importance in map making.
3. The scale of a map can be shown by three methods.
4. We need latitude and longitude to find location of a place on a map.
5. The world has been divided in 15° longitude time zones.
6. The physical and cultural landforms of Earth are shown by symbols on the map.
7. Maps tell us where we live on the Earth.

GLOSSARY

Globe	:	A model of Earth
Cardinal Points	:	East, West, North and South
Latitude	:	Angular measurement of a place taken from equator
Longitude	:	Angular measurement of a place taken from Prime Meridian
Prime Meridian	:	0° longitude
Equator	:	0° latitude
Time Zones	:	15° longitude zones in which the time is the same.
International Date Line	:	180° longitude
Contours	:	Lines on the map which join areas of equal height from the sea-level

QUESTIONS

1. Tick (✓) the correct answer:

i. The model of Earth is called:

a. Map b. Sketch
c. Globe d. Graph

ii. If we stand facing east, on our right side is:

a. West b. North
c. South d. North West

iii. Which direction has primary importance on the map?

a. East b. West
c. South d. North

iv. Situated in the east of Pakistan is:

a. Arabian Sea b. China
c. India d. Afghanistan

v. 0° latitude is called:

a. Equator b. Prime Meridian

c. International Date Line d. North Pole

vi. The difference of time after every 15° longitude is:

a. 1 second b. 1 minute

c. 1 hour d. 2 hours

vii. How many latitudes are:

a. 180° b. 100°

c. 260° d. 360°

viii. How many longitudes are:

a. 180° b. 360°

c. 260° d. 90°

ix. The lines joining areas of equal height on map are called:

a. Latitudes b. Longitudes

c. Isotherms d. Contours

x. The type of scale shown as a statement is called:

a. Representative Fraction b. Statement of Scale

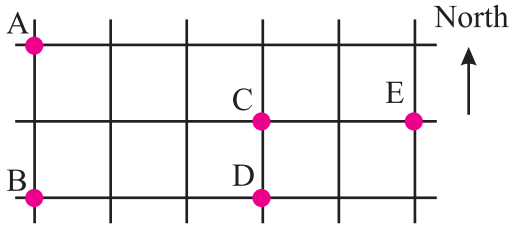
c. Linear Scale d. Graphic Scale

2. Give short answers:

i. What is the difference between map and globe?

ii. Observe the given model and tell:

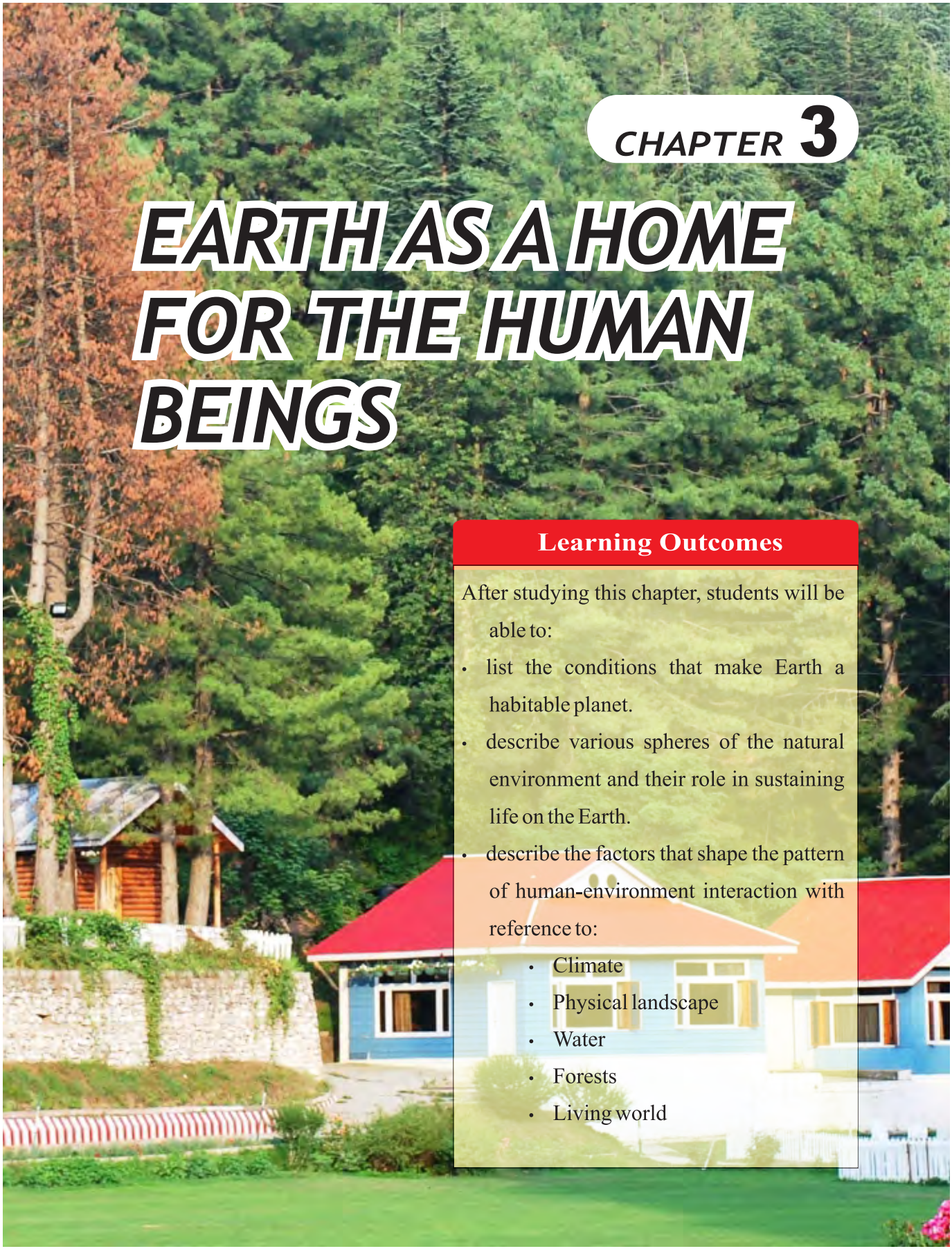
- In which direction E is situated from C?
- Which is the place in the south of A?
- Which is the place in the north of D?



iii. If there is 12:00 Noon in the Greenwich, find the time of the following cities:

- Cairo (Egypt) Longitude 30° East.
- New York (USA) Longitude 75° West.

3. What are the important components of a map? Also write a note on latitude and longitude.
4. Name the directions and write a note on types of North.
5. Describe the advantages of the maps.
6. Draw a sketch map of Pakistan and show primary directions on it.



CHAPTER 3

EARTH AS A HOME FOR THE HUMAN BEINGS

Learning Outcomes

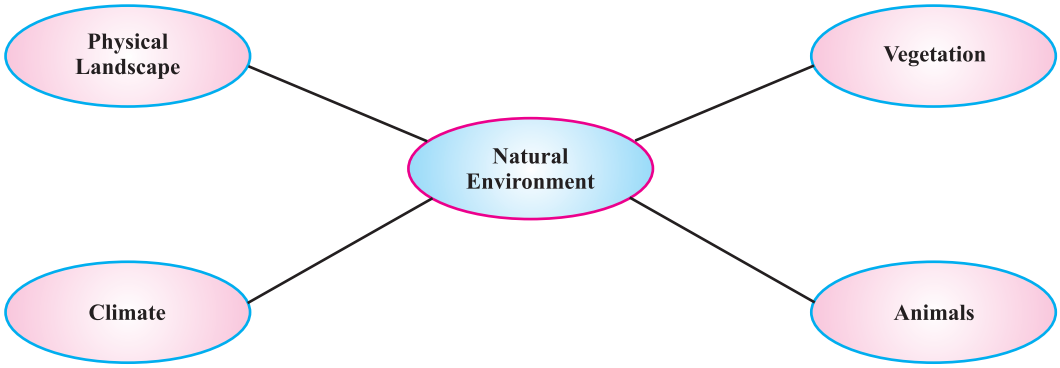
After studying this chapter, students will be able to:

- list the conditions that make Earth a habitable planet.
- describe various spheres of the natural environment and their role in sustaining life on the Earth.
- describe the factors that shape the pattern of human-environment interaction with reference to:
  - Climate
  - Physical landscape
  - Water
  - Forests
  - Living world

A. Introduction

The safe and secure place for a man to live is his home. Home provides the environment necessary for the human life to exist. Earth is also the home of human beings. It provides the natural environment on which his life depends.

The following model shows the different components of natural environment.



What makes the Earth Habitable?

The natural environment is present only on the Earth among the other planets of the solar system. That is why the Earth is inhabited and the other planets are uninhabited.

There are three basic reasons which make the Earth habitable:

1. Our Earth has suitable temperature for all forms of life. Mercury and Venus are very hot as they are nearer to Sun. Uranus and Neptune are very cold as they are farther from the Sun. There is no life on any planet other than the Earth.
2. Our Earth has a huge mass of water. Other planets do not have the same.
3. Earth has oxygen enriched air envelope called atmosphere due to which life is possible on it.

B. Natural Spheres of the Earth

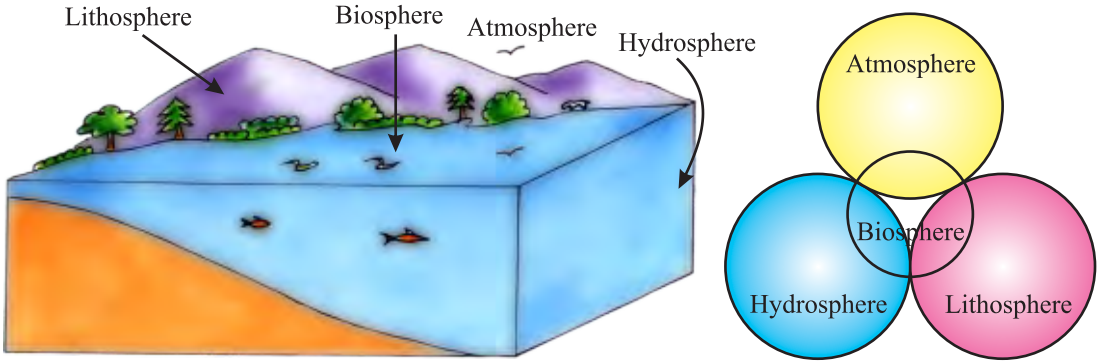
Earth is studied with respect to four spheres of the natural environment, i.e., Atmosphere, Lithosphere, Hydrosphere and Biosphere.

Let us have a look on these spheres:

1. Atmosphere

There is an envelope of different gases, water vapours and dust particles which surrounds our Earth. It is called atmosphere.

- These gases are nitrogen, oxygen, carbon dioxide, water vapours and dust particles. Oxygen is the most important gas due to which life is possible on the Earth.
- Carbon dioxide is the gas which the plants absorb and release oxygen in return.
- There is ozone too, which shields our Earth from the dangerous ultra-violet rays of the Sun.



(a) (b)

Natural Spheres of the Earth

2. Lithosphere

The surface area of our Earth is about 510 million sq. kms. About 29% of this area is comprised of land. This is called lithosphere. It is the portion on which the man lives.

- There are mountains, plains, forests and deserts on the lithosphere which provide habitats for different plants, animals and the human beings.
- Lithosphere is comprised of different types of rocks in which minerals are found. Human beings utilize these minerals in industries.
- There is soil on the lithosphere in which the natural vegetion flourishes and human beings grow crops.

3. Hydrosphere

About 71% of the Earth's surface is comprised of water in different shapes i.e, oceans, rivers and lakes etc. This is called hydrosphere.

- Human beings get fish from the hydrosphere.
- It is hydrosphere from where the water vapours enter the atmosphere by the process of evaporation. These water vapours turn into clouds by the process of condensation and produce rain which is beneficial for all forms of life on Earth.

4. Biosphere

It is the sphere of life comprised of plants, animals and human beings. It is dependent upon the other three spheres.

C. Human-Environment Relationship

Atmosphere, lithosphere, hydrosphere and biosphere collectively form the natural environment for the human beings. Human beings have a strong relationship with this environment. But this relationship is not the same everywhere on the Earth due to diversity in physical landscape and climate.

Let us analyze this relationship.

1. Climate and Human Beings

Our Earth is so big that the climate found in different parts is not similar. A lot of variation is found due to which the food, clothing and way of living of people is different.

Do you know?

More than half of the surface of Earth is too humid, too dry or too cold. That is why it is least populated. Maximum population is found in those areas which are neither too hot nor too cold.

Look at the following pictures.

The people living in cold climate wear woolen clothes and fur coats. Fish is an important part of their diet.

The people living in warm climate wear light dresses. Their diet is also simple.

Variation in climate also affects the colour, physique and working capabilities of human beings.

2. Physical Landscape and Human Beings

Although the plains are densely populated, however human beings are also settled in mountains and deserts and have adjusted their lives according to the environment. Let us have a look:

i. Mountains

- People living in mountains are physically strong because they live in difficult terrain.
- No flat land is available in mountains. That is why slopes are cut in to terraces for small scale cultivation of some crops like maize, rice, tea and fruits etc.

- Winters are severe in mountains while summers are pleasant. Life becomes paralysed during snowfall.
- Due to non availability of flat land, it is difficult to develop road and railway network.

Terrace forming

- Forests are found in mountains, so wood cutting is an important economic activity.
- Mountains are considered beautiful tourist resorts in the world.

ii. Plains

- Plains provide an easy environment as compared to mountains. Availability of flat land allows large scale cultivation, development of industries and transportation networks.
- Climate is not too severe, that is why plains are densely populated as compared to mountains.

Do you know?

80% of world's population resides in plains.

Plain

iii. Deserts

The amount of rainfall in deserts is very low, that's why there are no permanent rivers in deserts. Vegetation cover is absent. Only Cactus and Palms (date tree) grow in deserts. People spend a nomadic way of life in search of water and food.

Nomade

3. Water and Human Beings

In ancient times, there were no means of transportation. Man started his journey in waters with the help of circulating waves. Travelling in boats and ships, he began to know the world. Water is a basic necessity of life. That's why the human settlements from the very beginning originated near water bodies.

Water is present in different forms on the surface of Earth. Let us have a look:

i. Oceans

Modern Oil Tanker

- Oceans are important source of transportation. International trade is done mostly via sea-routes. These days thousands of ships are used for journey or trade. About half of the trade commodities is comprised of crude oil only.
- About 6000 years ago, Egyptians made canoes rowed by oars. It were also Egyptians who made the first wind driven yachts about 5000 years ago. The Romans constructed ships for trade about 2000 years ago.

Egyptian ship (5000 B.C)


Ancient Roman ship

- Ocean floors are the habitat of variety of living organisms. Information about these organisms was not possible before 1850 A.D. as there was no source of going deep into the oceans. After the invention of submarine this has become possible as well.
- About 85% of the fish catch of the world comes from oceans and the remaining 15% from rivers and lakes.
- Oceans keep the climate moderate.

ii. Rivers

- Rivers are important source of transportation.
- Hydro-electricity is generated from rivers.
- Rivers are important source of irrigation.
- Underground water is also used by humans for their basic necessities and irrigation.
- River valleys and lakes attract tourists by their scenic beauty.

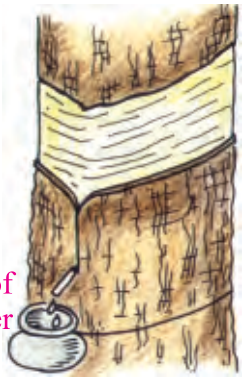
Use of water

4. Forests and Human Beings

- The relationship of human beings with forests is very old. Lumbering and gathering shrubs, herbs and fruits from forests is an ancient primary activity. Houses are constructed with wood in the mountains and wood is of vital importance in modern construction too.

Forests

- Forests not only enhance the beauty of natural environment but also the important source of oxygen.
- Manufacturing of natural rubber, paper and ships also dependents upon forests.
- Forests also affect the climate which has deep connection with life of human beings.



Collection of natural rubber

Do you know?

The area of forests should at least be 25-30% of a country. It is only 5% in Pakistan.

Interesting Information

The world's most dense forests are found near the equator. These are called Roof Gardens.

5. The Living World and Human Beings

Human beings catch fish, hunt birds and animals to get food. Besides they use animals for work according to the environment.

Animals are used for different purposes according to environment

- In Snowy areas, dogs are used to pull wooden sleighs.
- Camel is called plane of the desert because he can live several days without any food. In deserts, camel is used for transportation.
- Elephants are also used for heavy transportation.
- Oxen are used for traditional cultivation.

- Sheep are reared in grasslands to get wool.
- Horses and donkeys are used for transportation purposes.
- Silk is attained from silk worms which are reared on mulberry plants.

KEY POINTS

1. Earth is the only planet of the solar system where life exists.
2. Earth has been divided into four spheres. These spheres form natural environment for human beings.
3. Majority of the human beings are settled in those areas which have moderate climate.
4. Forests provide us oxygen.
5. Human beings utilize animals for different purposes.

GLOSSARY

Atmosphere:	The gaseous envelope surrounding the Earth.
Lithosphere:	The land portion of the Earth.
Hydrosphere:	The portion of the Earth covered by water.
Biosphere:	The part of the world where life exists.
Evaporation:	The process of conversion of water into vapours.

QUESTIONS

1. Tick (✓) the correct answer:

i. The gaseous envelope surrounding our Earth is called:

a. Atmosphere b. Lithosphere

c. Hydrosphere d. Biosphere

ii. Sphere of life is:

a. Atmosphere b. Lithosphere

c. Hydrosphere d. Biosphere

iii. Which gas shields us from dangerous ultra-violet rays of the Sun?

a. Cabon dioxide b. Oxygen

c. Ozone d. Nitrogen

iv. Due to which gas, life is possible on Earth?

a. Carbon dioxide b. Oxygen

c. Ozone d. Water vapours

v. What is the percentage of population settled in the plains?

a. 10 b. 20

c. 40 d. 80

vi. What is the percentage of fish caught from the oceans?

a. 20 b. 43

c. 64 d. 85

vii. Forests provide us:

a. Carbon dioxide b. Ozone

c. Oxygen d. Nitrogen

viii. Which areas receive least rainfall?

a. Mountains b. Plains

c. Oceans d. Deserts

ix. Natural silk comes from:

a. Forests b. Plants

c. Silkworm d. Industries

2. Give short answer:

i. What is meant by atmosphere?

ii. What is meant by lithosphere?

iii. What is meant by hydrosphere?

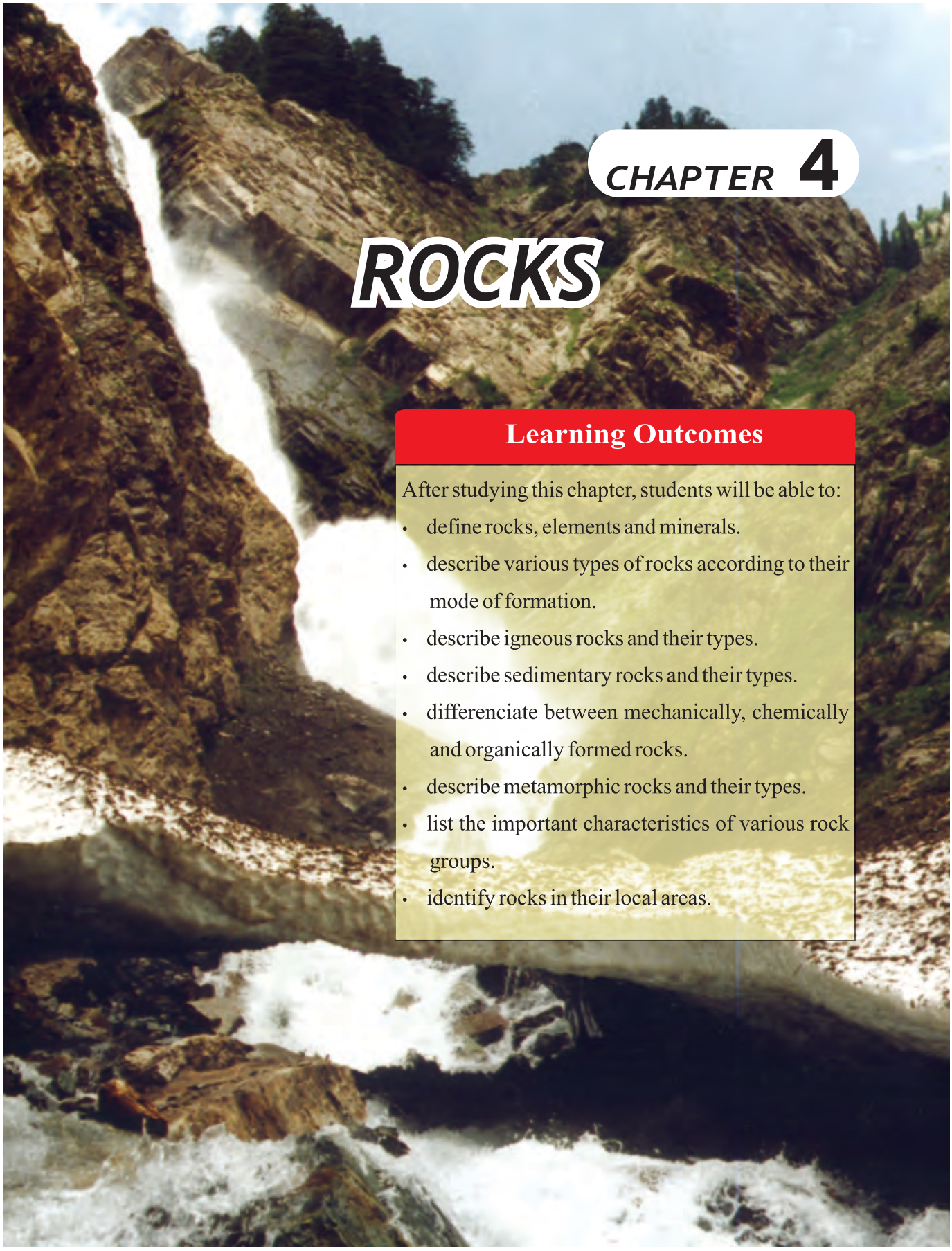
iv. Write the advantages of forests.

v. What is meant by biosphere?

3. Write a note on the relationship of climate and the human beings.

4. Write a note on physical landscape.

5. What is meant by natural environment? Also write a note on the relationship between forests and human beings.



CHAPTER 4

ROCKS

Learning Outcomes

After studying this chapter, students will be able to:

- define rocks, elements and minerals.
- describe various types of rocks according to their mode of formation.
- describe igneous rocks and their types.
- describe sedimentary rocks and their types.
- differenciate between mechanically, chemically and organically formed rocks.
- describe metamorphic rocks and their types.
- list the important characteristics of various rock groups.
- identify rocks in their local areas.

If we have a look on our daily life, we see that we use many natural things which are solid, e.g. salt, limestone, slate, chalk and marble etc. These are rocks found in the Earth. Lithosphere is formed by these elements, minerals and rocks.

Elements

An element is the simplest form of matter. All the things found in Earth are made of elements.

Minerals

Minerals are vital resources found in the Earth. Human beings use these resources i.e., coal, petroleum, salt, iron etc., for their benefit. These are comprised of different in-organic elements like oxygen, silicon, aluminium, iron, calcium, sodium, potassium and magnesium etc.

Rocks

Rock is a combination of two or more minerals. Lithosphere is formed by different types of rocks. Some of which are soft like shale and some are hard like diamond. In some rocks crystals are found and in some, fossils of animals and plants. Some rocks absorb water and some do not. These different characteristics are dependent upon the way of formation of these rocks.

Types of Rocks

There are three types of rocks according to their formation:

1. Igneous Rocks
2. Sedimentary Rocks
3. Metamorphic Rocks

1. Igneous Rocks

Going into the interior of the Earth, the temperature increases. In the centre, the temperature is estimated to be 5000° centigrade. Due to this high

range of temperatures, the minerals melt and a thick igneous matter "Magma" is formed. The magma, when comes on the surface of Earth is called "Lava".

Igneous rocks are formed by this molten matter when it solidifies either under or on the surface of the Earth.

Interesting Information

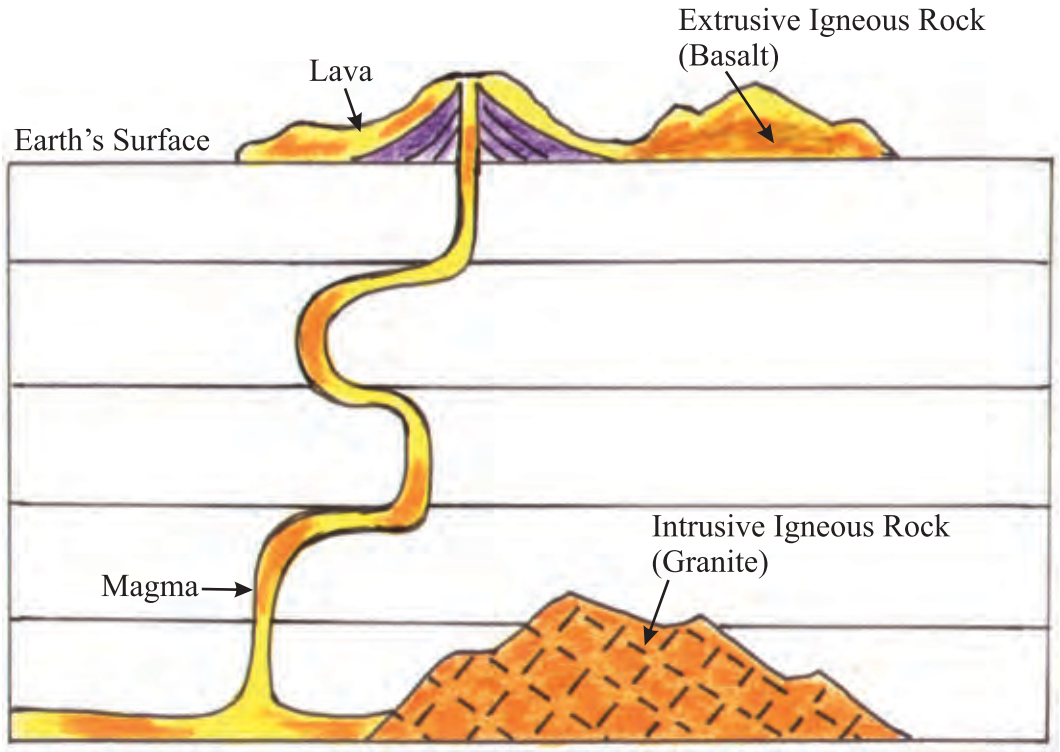
The word Igneous is derived from a latin word 'Ignis' which means 'fire'.

Types of Igneous Rocks

The molten matter moves under the surface of the Earth. This molten matter solidifies either deep inside the Earth or near its surface and somtimes on the surface of the Earth. According to their formation, there are two types of igneous rocks.

i. Intrusive Igneous Rocks

ii. Extrusive Igneous Rocks



Igneous Rocks

i. Intrusive Igneous Rock

When the molten matter solidifies deep inside the surface of the Earth, the rocks thus formed are called intrusive igneous rocks. They are also called plutonic rocks.

Granite, diorite and gabbro are examples of intrusive igneous rocks.

Diorite

Granite

Inside the Earth, the molten matter solidifies very slowly, so large crystals are formed in these rocks.

Think! Why the molten matter solidifies slowly inside the Earth?

ii. Extrusive Igneous Rocks

When the molten matter comes on the surface of the Earth and solidifies, the rocks thus formed are called extrusive igneous rocks. The molten matter can come on the surface of the Earth either through a volcano or from cracks and faults in the Earth's surface.

Basalt and obsidian are examples of extrusive igneous rocks.

Basalt

On the surface of the Earth the molten matter solidifies quickly, that's why crystals are not formed in these rocks and if formed, are too small to be seen.

Think! Why the molten matter solidifies quickly on the surface of the Earth?

In Pakistan, igneous rocks are found in areas of Hazara and Balochistan.

Obsidian

Characteristics of Igneous Rocks

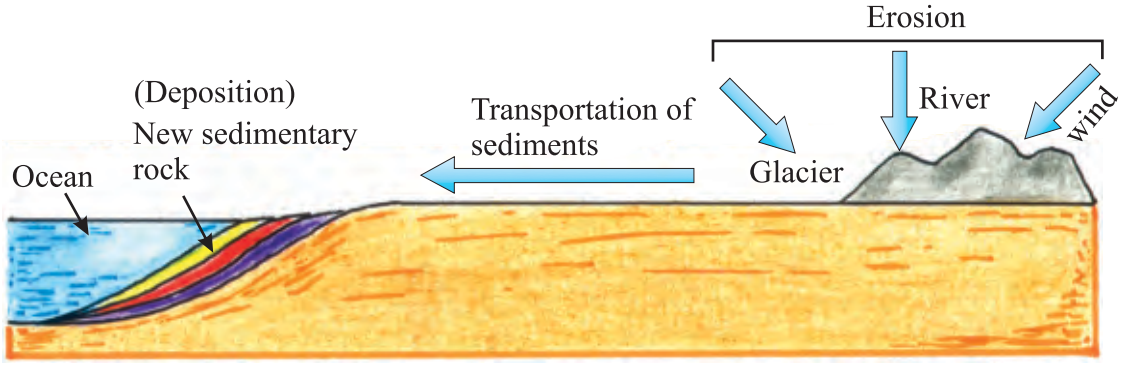
- Igneous rocks were formed in the beginning, that's why these are also called primary rocks.
- Crystals are found in these rocks.
- There are no layers in these rocks.
- These rocks are hard.
- Fossils of animals and plants are not found in these rocks.

Interesting Information

Continents are formed by granite and ocean floors are formed by basalt rocks.

2. Sedimentary Rocks

The rocks formed near or on the surface of the Earth are weathered



Sedimentary Rock

and eroded into sediments by solar heat, rain, wind, river or glacier. These sediments are transported to far off places and deposited layer by layer. These layers fix together firmly with the passage of time and a rock is formed which is called sedimentary rock.

Types of Sedimentary Rocks

According to their formation, there are three types of sedimentary rocks.

i. Mechanically formed Rocks
ii. Chemically formed Rocks
iii. Organic Rocks

i. Mechanically formed Rocks

Wind, river and glacier erode the rocks in different styles, transport the sediments and deposit them in layered form. The rocks formed by these layers are called mechanically formed rocks.

Conglomerate

Sandstone

Sandstone, shale and conglomerate are examples of mechanically formed rocks.

In Pakistan, these rocks are found in northern areas and Pothwar plateau.

Shale

ii. Chemically formed Rocks

There are different types of dissolved salts in the water found on the surface of the Earth. When this water evaporates, it leaves behind layers of salts. The rocks formed by these layers are called chemically formed rocks.

Rock salt, gypsum and dolomite are examples of chemically formed rocks.

Activity:

Take some water in a glass beaker. Dissolve some salt in it and boil until the whole water evaporates. Now observe the beaker. You will find a layer of salt at the bottom of the beaker.

Rock Salt

Gypsum

In Pakistan, these rocks are found in the areas of Salt Range, Daud Khel, Dera Ghazi Khan and Dadu.

iii. Organic Rocks

Organic rocks are formed by the fossils of animals and plants. Calcium and carbon are abundantly found in these rocks.

- These rocks are formed on the ocean floor as well as on land.
- If the fossils of animals are found in abundance then these rocks are called calcareous rocks. Calcium is abundantly found in these rocks.
- Limestone and corals are examples of calcareous rocks.

Calcareous Rock

Fossil of Dinosaur

In Pakistan, these rocks are found in areas of Salt Range and Hazara.

- If the fossils of plants are found in abundance then these rocks are called carbonaceous rocks. Carbon is abundantly found in these rocks.

Example:

Peat (raw coal) is a carbonaceous rock.

Peat (Coal)

In Pakistan, these rocks are found in areas of Salt Range, north west Balochistan and southern Sindh.

Characteristics of Sedimentary Rocks

- The outer surface of the Earth is formed mostly of sedimentary rocks.
- These rocks are identified easily because of their layered form.
- These rocks are mostly used in construction works.
- Fossils of animals and plants are found in these rocks.
- These rocks are comparatively less hard.

3. Metamorphic Rocks

The rocks formed on the surface of the Earth are weathered and eroded, while the rocks which are formed or buried under the surface of the Earth are changed. These changed rocks are called metamorphic rocks.

There are two main reasons of this change.

i. Temperature ii. Pressure

On the basis of these reasons, there are two types of metamorphic rocks.

i. Rocks formed by thermal metamorphism

ii. Rocks formed by regional metamorphism

i. Rocks formed by Thermal Metamorphism

- Have you ever seen the process of making bricks?

Bricks are made by clay, then placed in the kiln under fire. Two changes occur in the bricks by this process.

1. The colour of the bricks change and tiny sediments begin to shine.
2. The bricks get hard and compact.

- Clay utensils are made in the same way.

Same changes occur in the rocks by heat.

The molten matter (magma) moves beneath the Earth. When it moves inside the Earth, passes near or over a rock, changes its composition and structure and a new rock is formed. This process is called thermal metamorphism.

Marble

- Marble is a metamorphic rock formed by the alteration of limestone, a sedimentary rock.
- Sandstone, a sedimentary rock, changes into Quartzite.

Interesting Information

Limestone is used commonly for white wash in the houses while marble is used in construction for durability and beauty.

In Pakistan, marble is found in the area of Mullaghori (Khyber Pakhtun Khwa) and Balochistan.

ii. Rocks formed by Regional Metamorphism

The internal forces of the Earth i.e. earthquakes and mountain building forces cause a rock to sink inside the Earth. In this process, they become hard and compact due to the pressure and weight of overlying rocks. This process is called regional metamorphism.

Slate

- Shale, a sedimentary rock, after being changed turns into Slate.
- Slate a metamorphic rock, further transforms into Schist.

In Pakistan, slate rocks are found in areas of Abbottabad and Kund.

Characteristics of Metamorphic Rocks

- These rocks are formed by the alteration of pre-existing rocks.
- These are more smooth and shiny.

- These rocks are more hard and compact.
- Fossils of animals and plants are not found in these rocks.

KEY POINTS

1. Lithosphere is a combination of different elements, minerals and rocks.
2. Rock is a combination of two or more minerals.
3. There are three major types of rocks.
4. Igneous rocks are formed by the molten matter present under the surface of the Earth.
5. Sedimentary rocks are formed by the deposition of sediments in a layered form.
6. Metamorphic rocks are formed by the alteration of pre-existing rocks.
7. Crystals are found in igneous rocks.
8. Fossils of animals and plants are found in sedimentary rocks.

GLOSSARY

Element:	The simplest form of matter.
Minerals:	Combination of naturally occurring in organic elements.
Rock:	Combination of two or more minerals.
Magma:	Molten matter present inside the Earth.
Lava:	Molten matter, when it comes out on the surface of Earth.
Fossils:	The remains of animals and plants after decay.
Metamorphism:	The process of alteration of rocks.

QUESTIONS

1. Tick (✓) the correct answer:

i. Simplest form of matter is called:

a. Mineral b. Rock

c. Element d. Crystal

ii. Combination of two or more minerals is called:

a. Crystal b. Fossil

c. Rock d. Element

iii. Molten matter which comes out on the surface of Earth is called:

a. Magma b. Lava

c. Granite d. Rock salt

iv. One of these is an igneous rock:

a. Limestone b. Marble

c. Dolomite d. Basalt

v. One of these is a chemically formed sedimentary rock:

a. Rock salt b. Sandstone

c. Slate d. Gabbro

vi. One of these is a metamorphic rock:

a. Sandstone b. Obsidian

c. Marble d. Granite

vii. Found in Igneous rocks:

a. Fossils b. Crystals

c. Calcium d. Carbon

viii. The rocks in which fossils of animals are abundantly found:

a. Calcareous rocks b. Carbonaceous rocks

c. Chemically formed rocks d. Igneous rocks

ix. Found in sedimentary rocks:

a. Fossils b. Crystals

c. Diamonds d. Molten matter

x. After metamorphism, limestone becomes:

a. Slate b. Marble

c. Schist d. Quartzite

2. Give short answers:

i. How sedimentary rock is formed?

ii. What is meant by intrusive igneous rock?

iii. How metamorphic rock is formed?

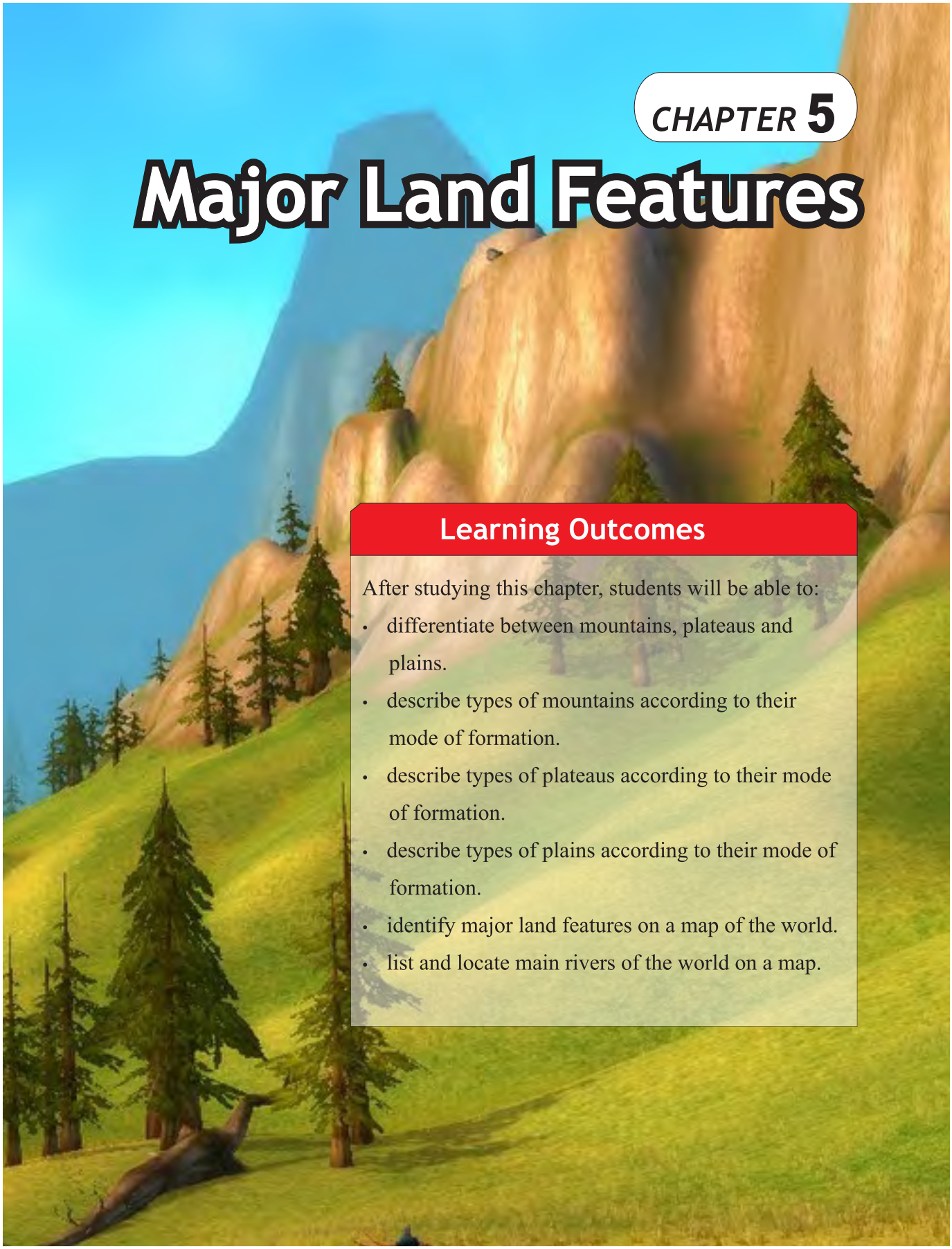
iv. What is meant by minerals?

v. Give three examples of igneous, sedimentary and metamorphic rocks each.

3. What is meant by a rock? Also write a detailed note on igneous rocks.

4. Write a detailed note on sedimentary rocks.

5. Classify rocks and write a detailed note on metamorphic rocks.



CHAPTER 5

Major Land Features

Learning Outcomes

After studying this chapter, students will be able to:

- differentiate between mountains, plateaus and plains.
- describe types of mountains according to their mode of formation.
- describe types of plateaus according to their mode of formation.
- describe types of plains according to their mode of formation.
- identify major land features on a map of the world.
- list and locate main rivers of the world on a map.

A. Introduction

The surface of our Earth is not homogenous. A variety of landforms can be seen on it. There are elevated portions in the form of mountains, table land like features which are called plateaus and vast stretches of flat land in the form of plains. Even the sea floor is comprised of uneven surface.

Landforms are formed by two forces:

i. Internal forces of the Earth

ii. External forces of the Earth

Let us have a look on these forces:

Do you know?

The study of landforms is called Geomorphology.

1. Internal Forces of the Earth

There are forces inside the Earth which push a part of Earth upwards or downwards. These forces create new landforms on the surface of Earth. The continents and mountain ranges are formed by these forces.

In the same way when the molten matter inside the Earth moves upwards, it comes out on the surface of the Earth and solidifies. A variety of landforms are created in this way i.e., volcanoes and plateaus.

2. External Forces of the Earth

Have you seen a sculptor working? He works on stone with his tools and carves out different features. In the same way when a part of Earth is uplifted by the internal forces, winds, rivers, glaciers and sea waves carve out different features on it. These are the external forces of the Earth. Dissected coast lines, valleys, lakes, waterfalls, various plateaus and plains etc. are formed by these forces.

Let us have a look on these major landforms.

B. Mountains

Mountain is a major landform which is clearly high from the surrounding areas and has a sloping surface. Its base is broad as compared to its top.

Interesting Information

The oldest mountains on the Earth came into being about 400 million years ago. They are called Caledonian mountains.

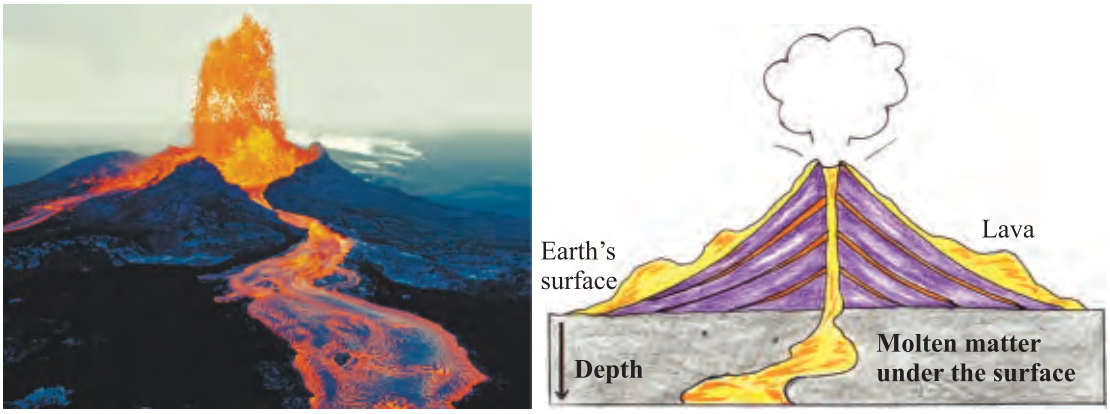
Types of Mountains

There are three types of mountains.

1. Volcanoes

The molten matter in the Earth tends to move inside the Earth. Sometimes, it comes out on the surface of the Earth through faults and cracks and solidifies in the form of either a rock or a mountain. It is called a volcanoe. It has a narrow passage to the top, called vent. Lava tends to come out from this vent regularly.

Fuji Yama, Krakatoa, Mayon, Etna and Cotopaxi are volcanoes.



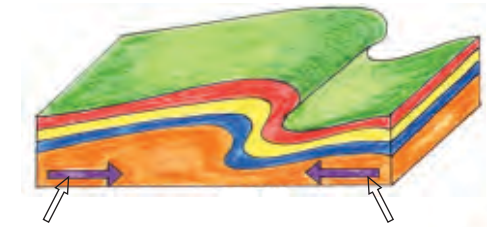
Volcanoes

2. Fold Mountains

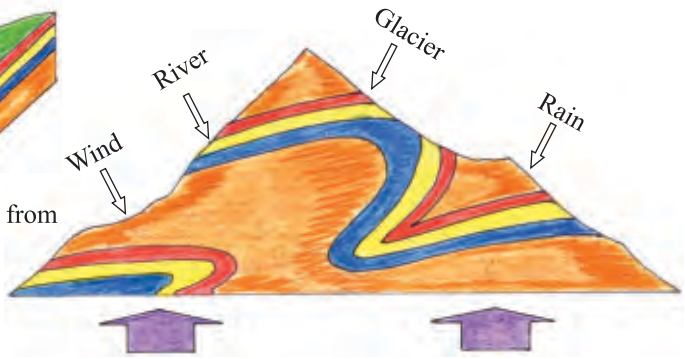
Most of the mountains are comprised of sedimentary rocks which are comparatively less hard. During the mountain building processes, when the internal forces put pressure on these rocks from the sides, folds occurred in these rocks. Later the internal forces uplifted them as mountains. These are called fold mountains.

Fold Mountains

Himalayas, Alps, Rockies and Andes are ranges of fold mountains.



(a) Folds

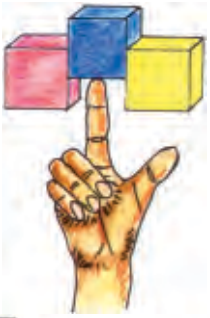


(b) Internal forces of Earth

Interesting Informations

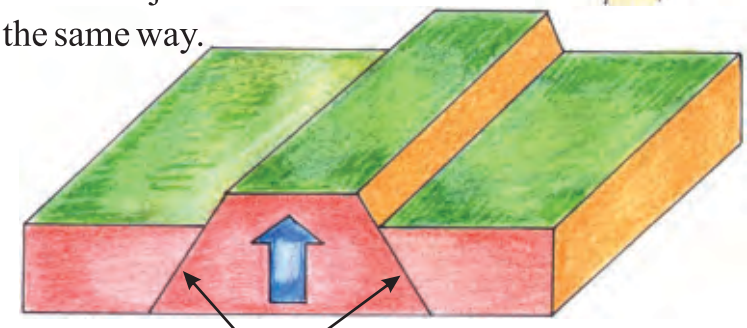
The largest range of volcanoes stretch around the Pacific Ocean. This is called "Ring of Fire".

3. Block Mountains



Take three wooden cubes and put them side by side. Now uplift the middle cube with the help of a finger. It will become high from the adjacent blocks. Block mountains are formed in the same way.

Unequal stresses and earthquakes create faults on the surface of the Earth. Sometimes the internal forces uplift a part of the Earth between these faults which becomes higher from the surrounding surface. It is called Block mountain.



Block Mountain

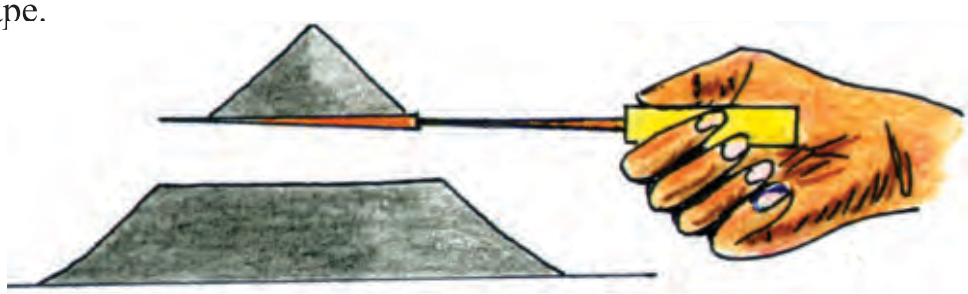
Do you know?

Sometimes a part of the Earth sinks between two faults. It is called a Rift Valley. There is a rift valley in East Africa which is about 3000 kilometres long.

Harz in Germany and Bihar mountains in India are block mountains.

C. Plateaus

Make a mountain 6 inches high with wet sand and then remove the upper half. Observe, what type of shape is left behind? Plateau has the same shape.



Plateau is a landform which is high from the surrounding surface like a mountain but has a flat and dissected top like a plain.

Types of Plateaus

Some plateaus were formed by the uplifting of areas during the mountain building processes in the past while some plateaus have also been formed by the solidification of lava on the surface of the Earth.

According to formation and location there are three types of plateaus.

1. Intermontane Plateaus

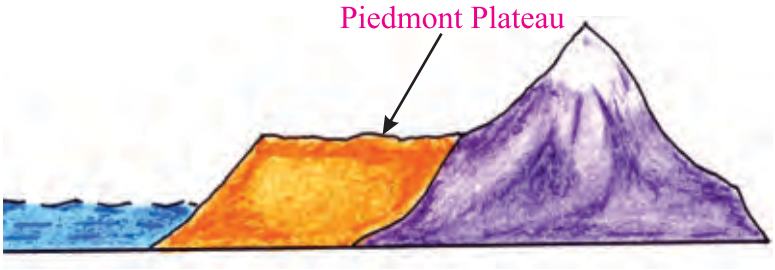
The plateau which is situated between high mountain is called intermontane plateau. Tibet and Bolivia are intermontane plateaus which have been formed with the creation of mountains.

Intermontane Plateau

2. Piedmont Plateaus

The plateau which is situated in the foot hills of mountains is called

piedmont plateau. On the other side, there is a plain or a sea. Patagonia and Colorado are piedmont plateaus which have also been formed with the creation of mountains.



3. Continental Plateaus

The plateau which is surrounded by plains or a sea is called a continental plateau. Saudi Arabia, Spain and Greenland are continental plateaus.

Continental Plateau

D. Plains

Vast stretches of flat above the sea level are called a plain.

Types of Plains

Mountains and plateaus came into being due to uplifting of flat areas. But the areas which were not affected by the internal forces of the Earth remained flat as plains. However, some of the plains also came into being by erosional and depositional processes.

Do you know?

Plains spread over one fourth of the surface of Earth. About 80% of world population lives in plains.

On this basis plains can be classified into two major types:

i. Erosional plains ii. Depositional plains

1. Erosional Plains

You have studied that when a landform appears on the surface of Earth, the external forces i.e., heat, rain, wind, river and glacier tend to reduce its height by erosion. The plains formed in such a way are called erosional plains.

Let us have a look on some of these:

i. Karst Plains

Some plains in the world are formed of limestone. These were once highlands which became lowlands due to the solution of limestone in water. Rainwater, surface water and underground water tend to dissolve limestone. These plains are called karst plains.

ii. Eolian Plains

In areas where the amount of rainfall is very low, wind has converted the exposed rocks into flat lands by erosion. Isolated less high column like hills can be seen in these plains. These are called eolian plains.

Eolian Plains

iii. Glacial Plains

In the ancient times Canada, Finland, Sweden and Russian Federation were covered with continental glaciers. These huge ice sheets converted these areas into flat lands by erosion. These are called glacial plains.

2. Depositional Plains

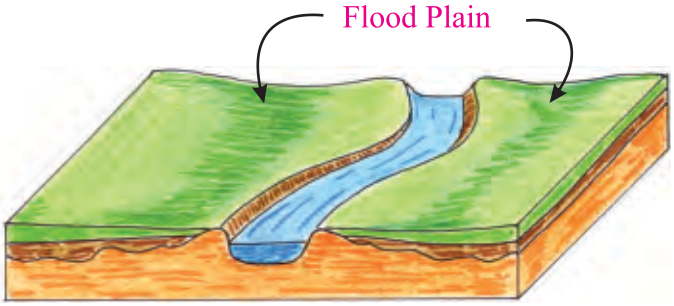
Most plains of the world are formed by the deposition of sediments transported by rivers, winds and glaciers. Such lans are called depositional

plains.

Lets have a look on some of these.

i. Flood Plains

When rivers are flooded, the water comes out of the banks and spreads over vast areas. When the water returns to its channel gradually, it leaves behind layers of fine sand and clay. The smooth plain thus formed is called a flood plain.



These plains are fertile and thus ideal for cultivation.

ii. Coastal Plains

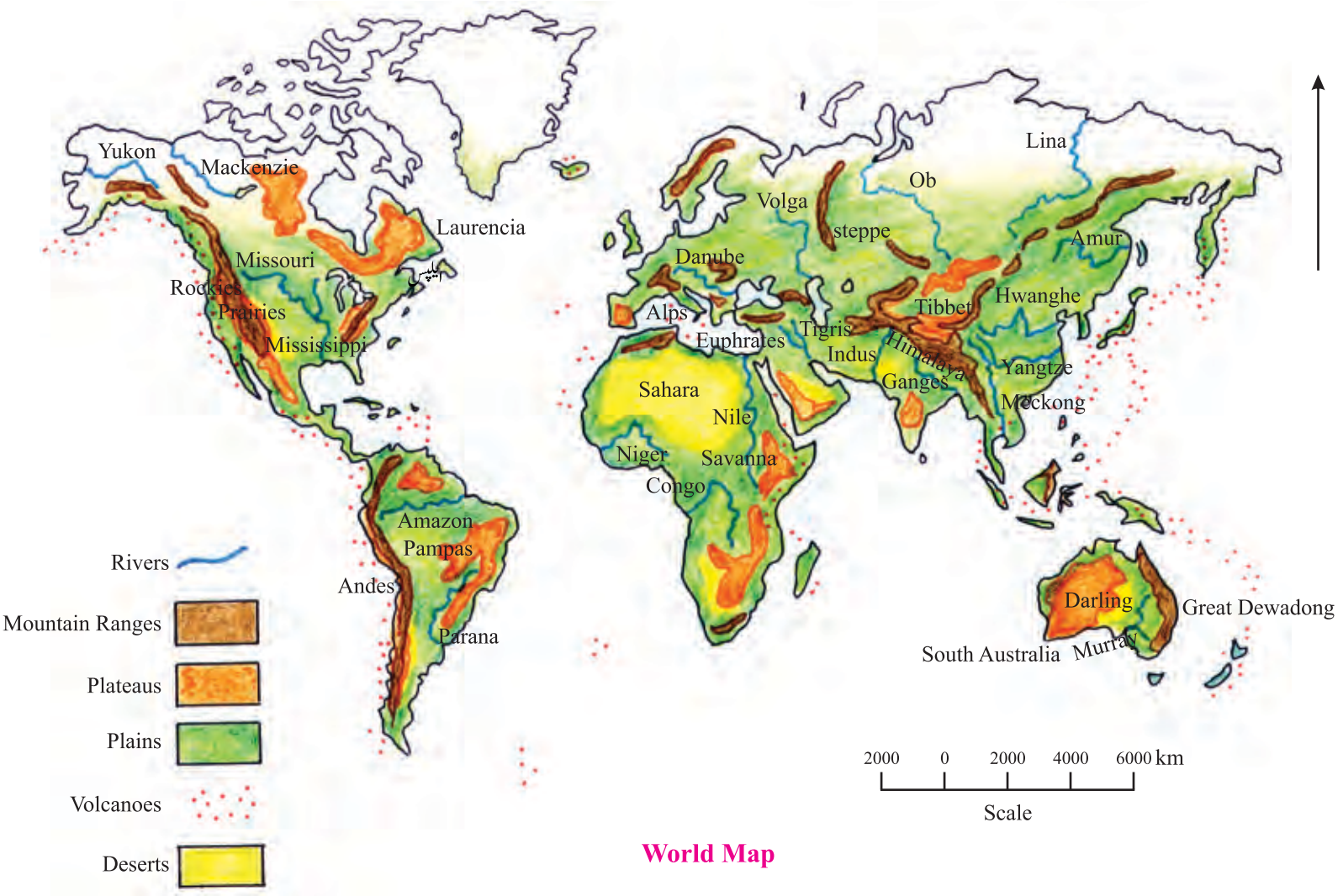
Coastal plains are formed in two ways.

Rivers, before entering the sea tend to deposit the layers of fine sand on the beach. Sea waves also deposit sand on the beach. These are called coastal plains.

Coastal Plain

iii. Loess Plains

Some plains of the world have been formed by very fine sand deposited by wind. These are called loess plains. The largest loess plain is situated in China.


Yukon
Mackenzie
Laurencia
Missouri
Rockies
Prairies
Mississippi
Amazon
Pampas
Andes
Parana
Volga
steppe
Danube
Alps
Euphrates
Tigris
Indus
Himalaya
Ganges
Sahara
Nile
Niger
Savanna
Congo
Ob
Lina
Amur
Tibbet
Hwanghe
Yangtze
Mekong
Darling
Great Dewadong
South Australia
Murray
Rivers
Mountain Ranges
Plateaus
Plains
Volcanoes
Deserts
2000 0 2000 4000 6000 km
Scale

World Map

E. Identification of Major Land Features and Rivers of the World

Activity:

On the world map given on the previous page, major land features and rivers of the world have been shown.

Identify the following rivers on that map and write, in which continent they are situated.

Ob, Lina, Amur, Hwanghe, Yangtze, Meckong, Ganges, Indus, Tigris, Euphrates, Congo, Nile, Niger, Volga, Danube, Mackenzie, Yukon, Missouri, Mississippi, Amazon, Parana, Murray and Darling.

Do you know?

Nile is the longest river of the world.

KEY POINTS

1. Landforms on the Earth are formed by internal and external forces of the Earth.
2. Mountains, plateaus and plains are major landforms.
3. Mountain is clearly high from the surrounding areas and has a sloping surface.
4. According to formation, there are three types of mountains.
5. Plateau is a landform which is high like a mountain but has a flat and dissected top like a plain.
6. According to formation and location, there are three types of plateaus.
7. A flat land is called a plain.
8. Plains have been formed by two ways.

GLOSSARY

Fold Mountains:	The mountains in which folds are found.
Intermontane Plateau:	The plateau situated between high mountains.
Piedmont Plateau:	The plateau situated at the foot of a mountain.
Continental Plateau:	The plateau which is surrounded by plains or a sea.
Erosional Plains:	The plains formed by erosion of heat, rain, wind, river and glacier.
Depositional Plains:	The plains formed by the deposition of sediments.
Karst Plains:	Plains formed by limestone solution.
Loess Plains:	Plains formed by the deposition of very fine sand.

QUESTIONS

1. Tick (✓) the correct answer:

I. One of these is a volcano:

a. Himalayas b. Harz

c. Krakatoa d. Rockies

ii. One of these is block mountain:

a. Harz b. Rockies

c. Mayon d. Etna

iii. One of these is a fold mountain range:

a. Fuji Yama b. Himalayas

c. Harz d. Cotopaxi

iv. The plateau situated between high mountains is called:

a. Intermontane Plateau b. Piedmont Plateau

c. Continental Plateau d. Rift Valley

v. The plains formed by the erosion of winds, rivers and glaciers are called:

a. Erosional Plains b. Depositional plains

c. Flood plains d. Loess plains

vi. Plains formed of limestone are called:

a. Loess Plains b. Desert Plains

c. Karst Plains d. Glacial Plains

vii. Alps are:

a. Block Mountains b. Fold Mountains

c. Volcanoes d. Plateaus

viii. The largest loess plain is situated in:

a. Pakistan b. Afghanistan

c. Germany d. China

2. Give short answers:

i. How landforms are formed?

ii. How fold mountains came into being?

iii. Write names of three types of plateaus.

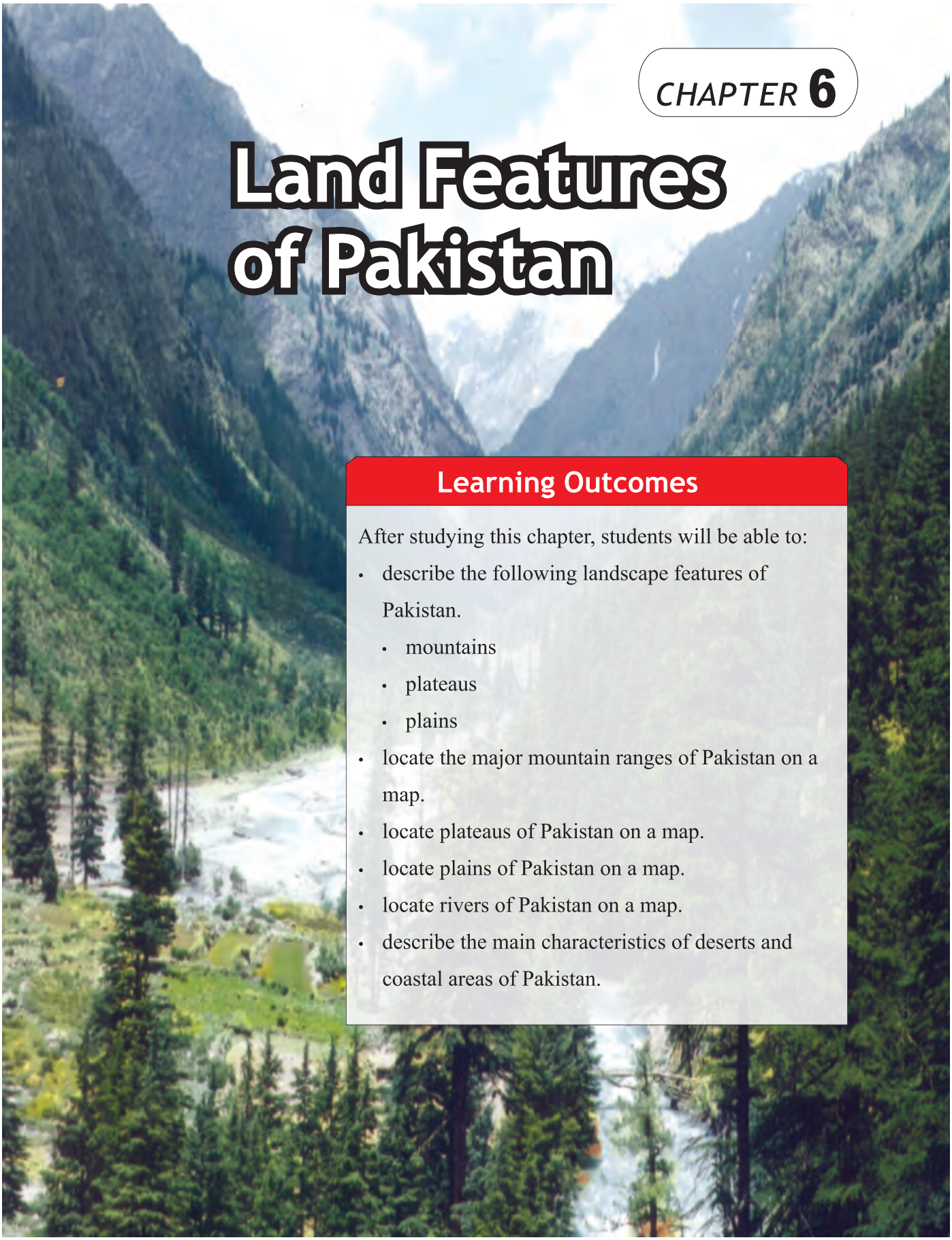
iv. Write names of two types of erosional and depositional plains each.

v. Write the names of four rivers from different continents.

3. Write a detailed note on the types of mountains.

4. How plateau is formed? Also write a note on the types of plateaus.

5. Write a detailed note on the types of plains.



CHAPTER 6

Land Features of Pakistan

Learning Outcomes

After studying this chapter, students will be able to:

- describe the following landscape features of Pakistan.
  - mountains
  - plateaus
  - plains
- locate the major mountain ranges of Pakistan on a map.
- locate plateaus of Pakistan on a map.
- locate plains of Pakistan on a map.
- locate rivers of Pakistan on a map.
- describe the main characteristics of deserts and coastal areas of Pakistan.

Nature has gifted our country with every type of landform. There are lofty snow peaked mountains, evergreen plains, deserts and coasts which have attraction for the tourists.

Scenic beauty of Pakistan

Let us have a look on the landforms of Pakistan:

A. Mountain Ranges

Arabian sea is situated in the south of Pakistan. Starting from its coast, the height increases towards north until we reach the high mountain ranges.

The mountain ranges of Pakistan are divided into two segments.

i. Northern Mountains

ii. North Western and Western Mountains

These two mountain ranges meet together at "Pamir Knot" in the north west of Pakistan.

Lets have a look on these mountain ranges.

1. Northern Mountains

There are two ranges in the northern mountains.

i. Himalayas

ii. Karakoram

Interesting Information

The highest mountain in the world is Mount Everest. It has a height of 8850 metres and is situated in Nepal.

i. Himalayas

The Himalayas are divided into three segments which are situated parallel to each other from south east to north west.

Siwalik Hills

Siwalik hills are situated in Islamabad, Murree, Hazara and Abbottabad. Average height of the these hills is about 800 metres.

Shah Faisal Mosque situated in the foot hill of Siwalik hills

Lesser Himalayas

In the north of Siwalik hills, are the mountains of Azad Kashmir and Pir Panjal. Average height of these mountains is about 4000 metres. These are called Lesser Himalayas.

Greater Himalayas

Greater Himalayas are situated in the north of Lesser Himalayas. These snow peaked mountains are situated in Swat, Kohistan and Gilgit. Average height of these mountains is about 6000 metres. The highest peak of this range is Nanga Parbat which is 8126 metres high.

Nanga Parbat

ii. Karakoram

In the north of Greater Himalayas, there is another range of snow peaked mountains, situated in Gilgit up to Skardu. This is called Karakoram range. The highest peak of this range is K2 which is 8611 metres high. K2 is also called Godwin Austin. It is the second highest peak of the world.

Huge glaciers are found in this range in which Siachin, Hispar, Baltoro, Biafo and Batura are important.

K2

Interesting Information

Karakoram highway also called "Silk Route" passes through the Karakoram range. It connects Pakistan with China via Khunjerab Pass.

2. North Western and Western Mountains

There are three mountain ranges in the west of Pamir Knot. Their height decreases towards south. These mountain ranges are:

i. Hindukush Mountains

Hindukush mountains are situated in the north west of Pakistan along the border of Afghanistan. This mountain range stretches from Chitral, Swat and Malakand up to river Kabul in the south. The highest peak of this range is Tirich Mir which is 7690 metres high.

Tirich Mir

ii. Sufaid Koh and Waziristan Hills

In the south of Hindukush Mountains, from river Kabul to river Kurram, along the border of Afghanistan is the mountain range called Sufaid Koh. These mountains are situated in Mohmund and Khyber agency. The valleys of Peshawar, Kohat and Bannu are also situated in these mountains. The highest peak of this range is Sikeram which is 4761metres high.

In the further south of Sufaid Koh from river Kurram to river Gomal are situated the less high Waziristan hills.

Interesting Information

The famous Khyber Pass is situated in Sufaid Koh. It connects Pakistan with Afghanistan.

iii. Suleman and Kirthar Mountains

In the south of river Gomal up to river Bolan is situated the mountain range, known as Suleman mountains. These mountains are situated along the river Indus between Punjab and Balochistan. The highest peak in this range is Takht-e-Suleman which is 3487 metres high.

In the further south of river Bolan between Balochistan and Sindh is the mountain range known as Kirthar mountains.

B. Plateaus

There are two plateaus in Pakistan. Let us have a look on these.

1. Pothwar Plateau

This a piedmont plateau situated in south of Siwalik hills. To its east is river Jhelum, towards west river Indus and to its south is the Salt range.

Do you know?

The largest salt mine "Khewra" is situated in Pakistan in the Salt Range.

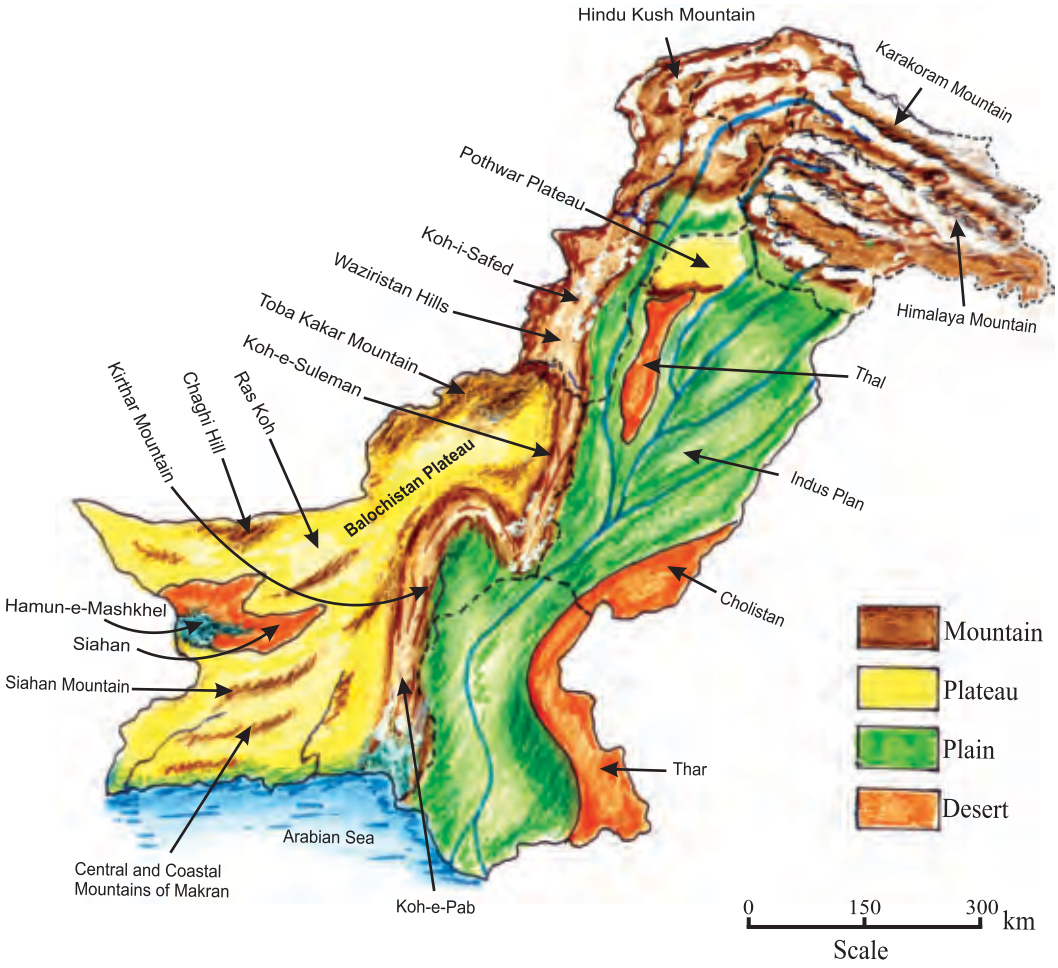
Pothwar plateau is comprised of high and low hills. Soan, Haro and Korang are the main rivers while Sakessar, Kalar Kahar and Khabeki are the beautiful places.

2. Balochistan Plateau

This is a vast plateau situated in the west of Suleman and Kirthar mountains. Many mountain ranges are situated in this plateau. These are:

- The coastal and central Makran mountains
- Siahan mountains
- Ras koh
- Chaghai mountains
- Pub mountains
- Toba Kakar mountains

The highest peak is Ras Koh which is 3010 metres high.



Land Features of Pakistan

The western part of Balochistan plateau is dry due to shortage of rainfall. Here lies a desert between Chaghai and Siahan mountain in which there is a salt lake known as "Hamun-e-Mashkhel". Zhob, Bolan, Hub, Porali, Hingol and Dasht are the main rivers of Balochistan Plateau.

C. Plains

Balochistan is a plateau. Most of the area of Khyber Pakhtun Khwa and the northern areas are comprised of high mountains, while Punjab and Sindh have been formed by the deposition of alluvium by river Indus and its

tributaries. That's why it is called Indus plain.

Indus plain has been divided into three parts:

1. Upper Indus Plain

River Indus comes out of the northern mountains and enters into plains. Here the following rivers join it from the eastern side one by one.

Do you know?

Indus is the longest river of Pakistan. Its length is 2900 kilometres.

i. Jhelum ii. Chenab iii. Ravi iv. Sutlej

Up to Mithan Kot, the maximum part of Punjab has been formed by the deposition of these rivers. It is called Upper Indus Plain. It is very fertile and very much favourable for cultivation.

Rivers of Pakistan

2. Lower Indus Plain

From Mithan Kot to Thatta in the south, the plain area is called Lower Indus Plain. Cholistan and Thar deserts are situated in east of river Indus. Apart from the desert, the rest of the plain is suitable for cultivation.

3. Deltaic Indus Plain

From Thatta to the coast of Arabian sea in the south, the plain area is called Deltaic Indus Plain. Here the speed of river Indus is very slow due to very gentle slope and it is divided into many branches. It is a swampy area.

D. Deserts

The amount of rainfall is low in most of the areas of Pakistan and some areas are very dry, so large deserts occupy the land.

Lets have a look on these deserts:

1. Thal Desert

This desert is situated in Punjab. To its north is the Salt range, in the east are river Jhelum and Chenab and to its west is river Indus. Thal desert spreads over the areas of Mianwali, Khushab, Bhakkar, Layyah and Muzaffargarh.

2. Cholistan Desert

This desert is situated in the south eastern Punjab. To its west are river Sutlej and Indus, while the eastern side is bordered by India. Cholistan desert spreads over the areas of Bahawalnagar, Bahawalpur and Rahim Yar Khan.

Drawar Fort - Cholistan

3. Thar Desert

It is situated in the eastern Sindh. It joins Cholistan in the north and

Rajashthan desert of India in the east. River Indus flows in its west. Thar desert spreads over the areas of Ghotki, Sukkur, Khairpur, Sanghar and Tharparkar.

4. Kharan Desert

This desert is situated in western Balochistan. In its north are Chaghai mountains, in south Siahan mountains, in east Ras Koh and in its west lies Iran. Kharan desert spreads over the area of Chaghai and Kharan.

E. Coastal Areas

Arabian sea is situated in the south of Pakistan. The coastal belt along the Arabian sea is more than 1000 kilometres long. It can be divided into two parts.

1. The Coastal Belt of Balochistan

This belt is about 700 kilometres long. Ports of Gawadar, Pasni and Lasbela are situated on this belt. The coastal belt of Balochistan is partly flat and partly mountainous, that's why it is not much vast.

2. The Coastal Belt of Sindh

This belt is more than 300 kilometres long. Ports of Karachi, Bin Qasim and Keti are situated on this belt. The coastal belt of Sindh is flat, that is why it is more vast.

KEY POINTS

1. The mountain ranges of Pakistan are divided into two segments.
2. Himalayas and Karakoram are part of northern mountains.
3. Hindukush, Sufaid Koh, Waziristan hills, Suleman and Kirthar mountains are part of north western and western mountains.
4. Pothwar and Balochistan are the two plateaus of Pakistan.
5. The Indus plain has been divided into three parts i.e. Upper Indus Plain, Lower Indus Plain and Deltaic Indus Plain.

6. Thal, Cholistan, Thar and Kharan are the deserts of Pakistan.

7. Arabian sea lies in the south of Pakistan.

8. Gawadar, Pasni, Lasbela, Karachi, Bin Qasim and Keti are the important ports of Pakistan.

GLOSSARY

Pamir Knot:	The place where northern and north western mountains meet
Upper Indus Plain:	The plain area upto Mithan Kot
Lower Indus Plain:	The plain area between Mithankot and Thatta.
Deltaic Indus Plain:	The plain area between Thatta and the coastal belt of Arabian Sea.

QUESTIONS

1. Tick (✓) the correct answer:

i. One of these is part of northern mountain range:

a. Sufaid Koh b. Kirthar Mountains

c. Hindukush Mountains d. Himalayas

ii. One of these is part of western mountain range:

a. Siwalik b. Karakoram

c. Suleman Mountains d. Himalayas

iii. K2 is the highest peak of:

a. Hindukush Mountians b. Karakoram Mountains

c. Himalayas d. Suleman Mountains

iv. One of these is the river of Balochistan:

a. Ravi b. Sutlej

c. Kabul d. Bolan

v. The mountain range situated between Balochistan and Sindh is:

a. Himalayas b. Hindukush

c. Suleman Mountains c. Kirthar Mountians

vi. The height of K2 is:

a. 7690 metres b. 8125 metres

c. 8611 metres d. 3487 metres

vii. Situated between Mithan Kot and Thatta is called:

a. Upper Indus Plain b. Lower Indus Plain

c. Suleman Mountains d. Waziristan Hills

viii. The desert situated in Sindh is:

a. Cholistan b. Thal

c. Kharan c. Thar

ix. The length of coastal belt of Sindh is about:

a. 300 km b. 700 km

c. 1000 km d. 1500 km

x. The sea situated in the south of Pakistan is:

a. Mediterranean Sea b. Bay of Bengal

c. Red Sea d. Arabian Sea

2. Give short answers:

i. Write a brief note on Balochistan plateau.

ii. Write a brief note on river Indus.

iii. Write the names of four rivers of Balochistan.

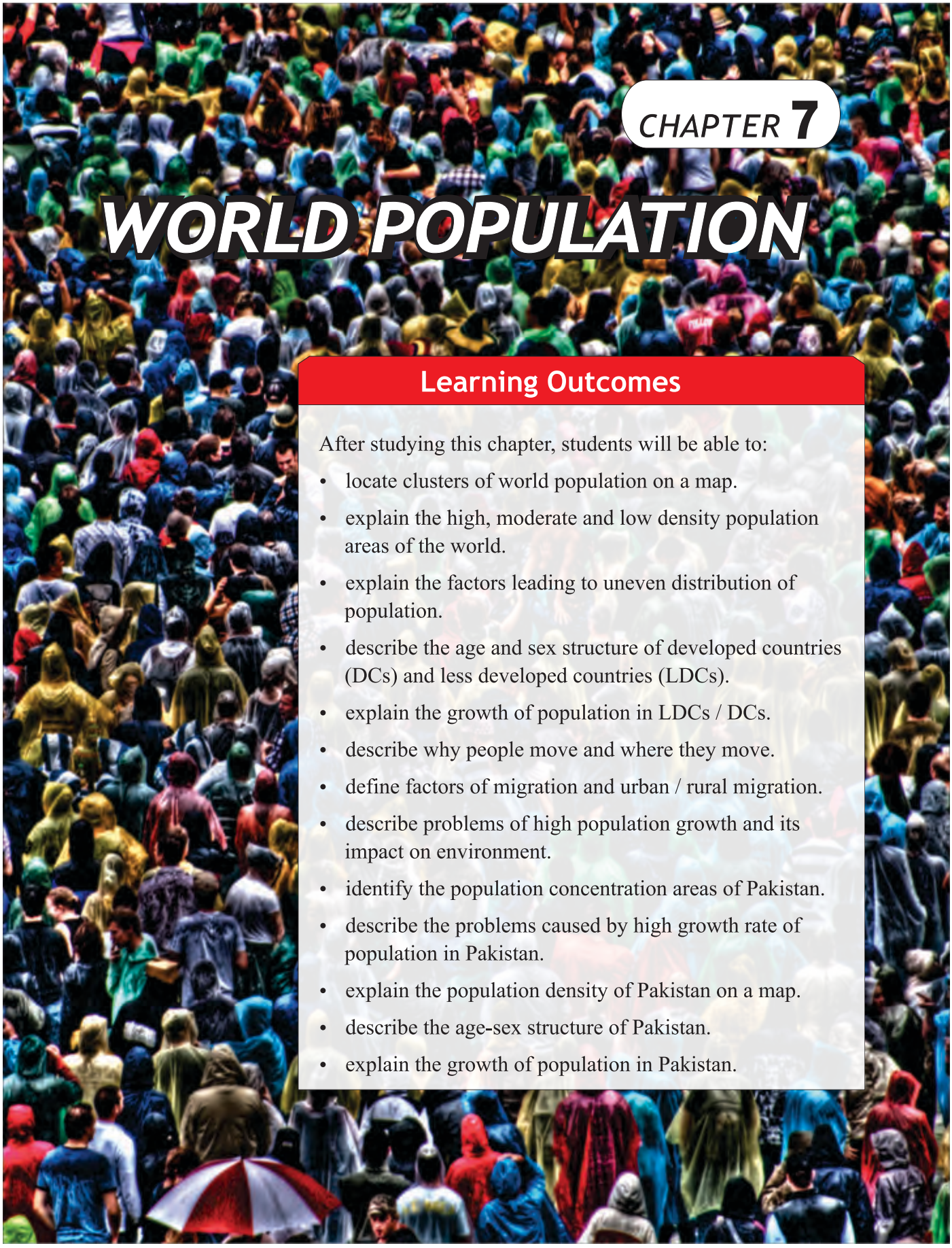
iv. Write the names of the deserts of Pakistan.

v. Write the names of four ports of Pakistan.

3. Write a note on northern mountains of Pakistan.

4. Write a note on north western and Western mountains of Pakistan.

5. Write a detailed note on the Indus plain.



CHAPTER 7

WORLD POPULATION

Learning Outcomes

After studying this chapter, students will be able to:

- locate clusters of world population on a map.
- explain the high, moderate and low density population areas of the world.
- explain the factors leading to uneven distribution of population.
- describe the age and sex structure of developed countries (DCs) and less developed countries (LDCs).
- explain the growth of population in LDCs / DCs.
- describe why people move and where they move.
- define factors of migration and urban / rural migration.
- describe problems of high population growth and its impact on environment.
- identify the population concentration areas of Pakistan.
- describe the problems caused by high growth rate of population in Pakistan.
- explain the population density of Pakistan on a map.
- describe the age-sex structure of Pakistan.
- explain the growth of population in Pakistan.

A. Distribution of Population

More than 7.16 billion people live in the world but the distribution of population is not uniform. Some areas are very densely populated, some least populated and some are moderately populated.

The distribution of world population in different continents is as under:

Continent	Population (billion)	Percentage
Asia	4.298	60.02
Africa	1.111	15.52
Europe (Including Russia)	0.742	10.36
North America	0.565	7.90
South America	0.407	5.67
Austraila	0.038	0.53

Source: Population Reference Bureau
US Census Bureau

Density of Population

Do you know?

Density of population can be calculated by dividing the population over area.

The number of people per square kilometre is called density of population. Let us find the density of population of the world.

World Population = 7.16 billion

Area of land on the Earth's surface = 149 million sq. km

Density of Population = 48 persons per sq. km

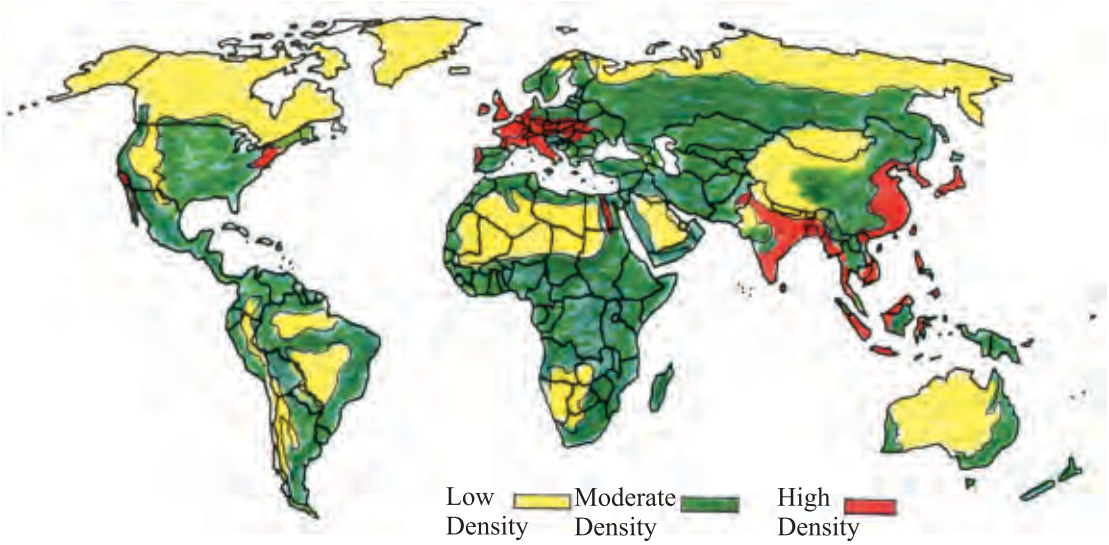
It means that on average 46 persons are living in a square kilometre of land.

According to density, we can divide the world into three regions.

1. High Density Population Areas

The average density of population of the world is 48 persons per square kilometre. But in some areas the density is about thousands of people per square kilometre.

Let us have a look on these areas and try to find out the factors due to which these areas are densely populated.



Population Density Map of the World

i. East, South East and South Asia

In this area, countries like China, Japan, Indonesia, Phillipines, Vietnam, India, Pakistan and Bangladesh are very densely populated. Fertile river valleys and moderate climate of coastal areas are the main reasons of high density.

ii. Western and Central Europe

In this area countries like France, Belgium, Holland, Germany, Czech Republic and Austria are very densely populated. Suitable climate and industrial development are the main reasons of high density.

iii. North East of North America

In this area, north eastern portion of United States of America and south eastern portion of Canada is very densely populated. Industrial development and moderate climate of coastal areas are the main reasons of high density.

2. Moderate Density Population Areas

These areas are comprised of grasslands of the world where population is scattered over a large area. The density of population ranges between 10 to 50 persons per square kilometre. These grasslands are known by different names, i.e.,

- Steppes of Asia and Europe
- Prairies of North America
- Pampas of South America
- Savannas of Africa
- Downs of Australia

These are the famous agricultural areas of the world.

3. Low Density Population Areas

Extreme cold, hot, rainy and dry areas of the world are the least populated. In these areas, the density of population is less than 10 persons per square kilometre. These areas include:

- Polar areas
- Snow peaked mountains like Himalayas, Alps, Rockies and Andes
- Equatorial rain forests
- Deserts i.e., Sahara, Kalahari, Atacama, Arab and Rajasthan etc.

B. Structure of the Population

Structure of the population involves the study of sex and age.

- According to sex, population can be divided into two groups:
  - i. Male Population
  - ii. Female Population
- According to age, population can be divided into three groups:
  - i. Children up to 15 years
  - ii. Adults 15 to 60 years
  - iii. Aged More than 60 years

Do you know?

Study of population is called Demography.

Usually sex and age are studied together which is called sex-age structure. It tells us:

- Whether the males are dominant in the population or females?
- What is the percentage of children, adults and aged in the population?

The sex-age structure in more developed countries (MDCs) is different form less developed countries (LDCs).

Sex-Age Structure of MDCs

Country	Population (Million)	Sex		Age		
		Male %	Female %	Children %	Adults %	Aged %
Japan	128	43	57	13	64	23
Germany	82.7	47	53	13	66	21

The low percentage of children in MDCs indicates that the population growth rate is very low.

Sex-Age structure of LDCs

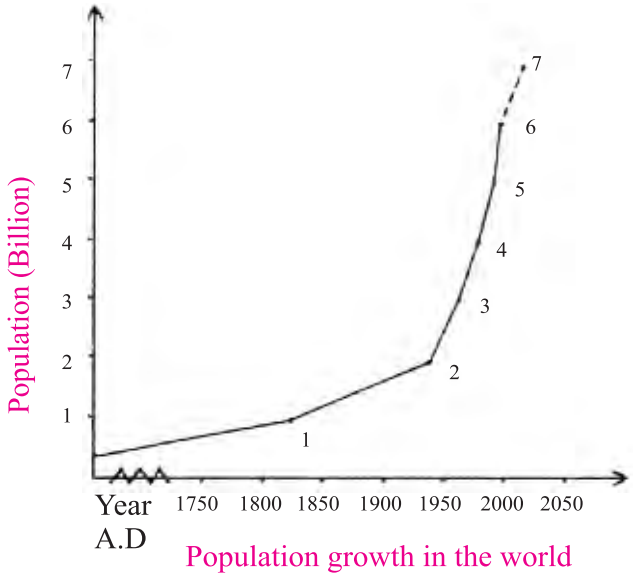
Country	Population (Million)	Sex		Age		
		Male %	Female %	Children %	Adults %	Aged %
Liberia	4.2	53	47	43	54	3
Uganda	39	50	50	49	48	3

The high percentage of children in LDCs indicates that the population growth rate is very high.

Think! What else does the sex-age structure of MDCs and LDCs show?

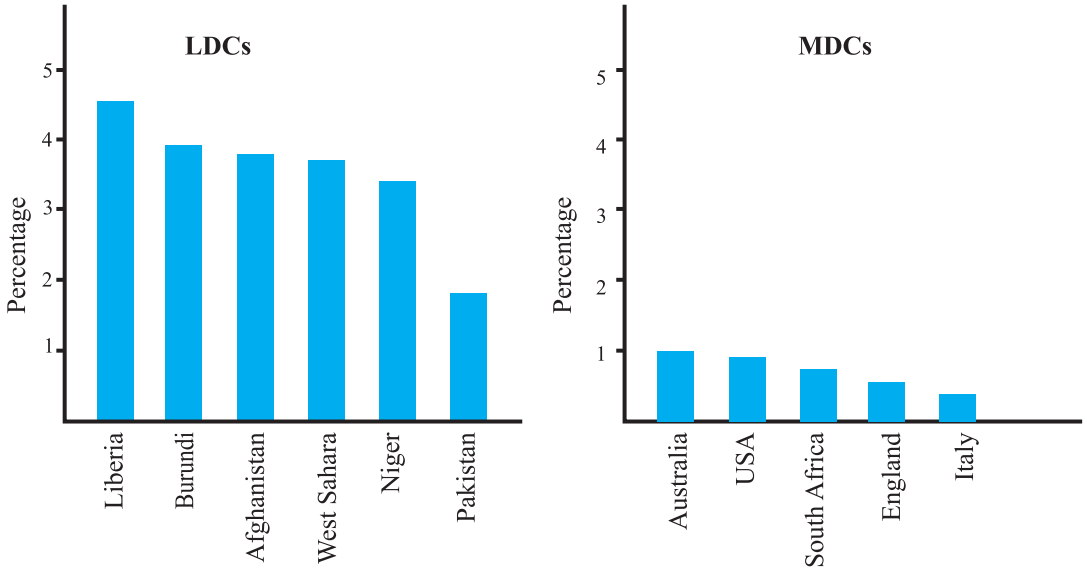
C. Population Growth

At the beginning of the year A.D, the total population of the world was 300 million which became 7.16 billion in 2013. At present the population is growing at the rate of 1.09% annually.



Population growth in the world

The rate of population growth is different in different countries. In less developed countries (LDCs) it is very high, especially in African countries. In more developed countries (MDCs) it is very low.



Annual Population Growth Rate

Interesting information

There is an increase of about 82 million persons in the world population every year. It means that about 6.8 million persons every month, about 2,28,930 persons every day and about 9538 persons every hour are adding up in the total population.

D. Movement of Population

The spread of population over the surface of the Earth shows that human life is mobile. From the beginning, the humans have tend to come out of their native areas and settle in new places. The human life is still on the move and will continue in the future too. This movement is called migration.

Why People Migrate?

There are many reasons of migration, but most common are:

1. Sometimes, people move from one area to another for better economic conditions.
2. Conflict within a country or war with another country force people to leave their areas.

3. For religious freedom and cultural traditions, people move from one place to another. For example, at the time of independence, a large number of people migrated from India to Pakistan.

4. Natural disasters and hazards force people to leave their areas.

Due to the severe floods in Pakistan in August 2010, millions of people had to leave their areas.

Types of Migration

There are two types of migration:

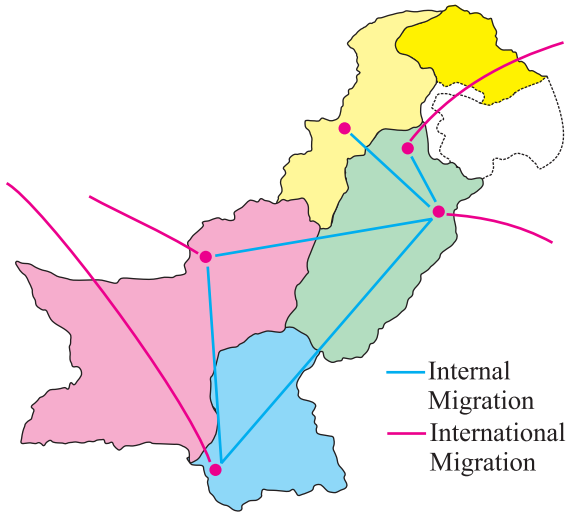
1. Internal Migration
2. International Migration

1. Internal Migration

The movement within a country from one place to another is called internal migration. It can be inter-district and inter-province from:

- Village to village
- City to city
- Village to city
- City to village

Among these, the migration between village and city is of vital importance. People tend to move towards cities for better education, medical facilities, jobs and better standard of life.



Migration

2. International Migration

The movement from one country to another is called international

migration.

Factors of Migration

Keeping in view the reasons, it is necessary to discuss two main factors of migration.

1. Push Factors

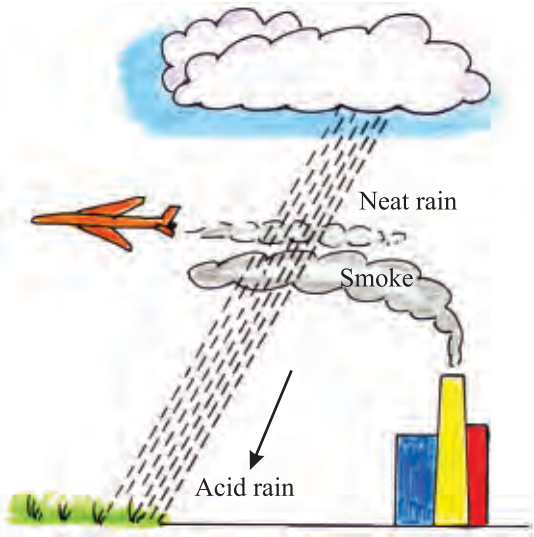
These are the factors which force people to leave their areas e.g., poor economic and social conditions, natural disasters and war.

2. Pull Factors

These are the factors which attract people to move to a new place e.g., better economic opportunities, standard of life and peaceful conditions.

E. Impacts of Population Growth on Environment

The necessities of life increase with the increase in population. To meet those necessities, the efforts made by human beings affect the natural environment directly.



Acid rain results from air pollution, which affects the crops.

Let us have a look on the following pictures in which some important problems have been highlighted.

Tree cuttingresults inthe reduction of oxygen.

Clearance of forest and reduction of agricultural land cause desertification.

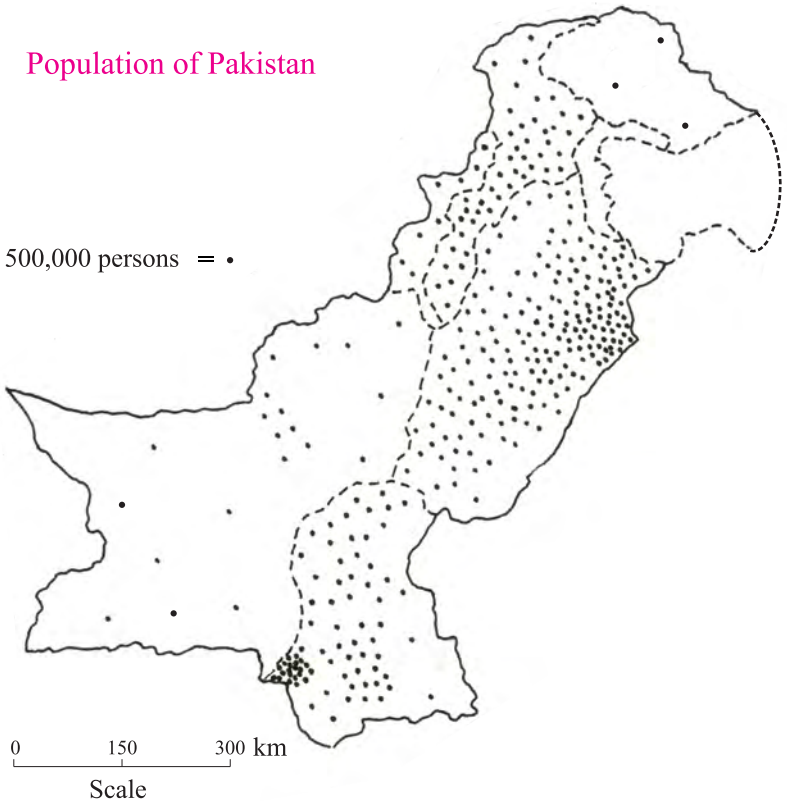
Construction of housing schemes on agricultural lands increase air temperature.

F. Population of Pakistan

According to population Pakistan is the sixth largest country of the world. The present population of Pakistan is about 191.71 million. Like the world, the distribution of population in Pakistan is not uniform too.

Distribution and Density of Population

According to the 1998 census the density of population in Pakistan was 166 persons per square kilometre, which is about 236 persons per square kilometre at present. The distribution and density of population is shown in the following maps and table.

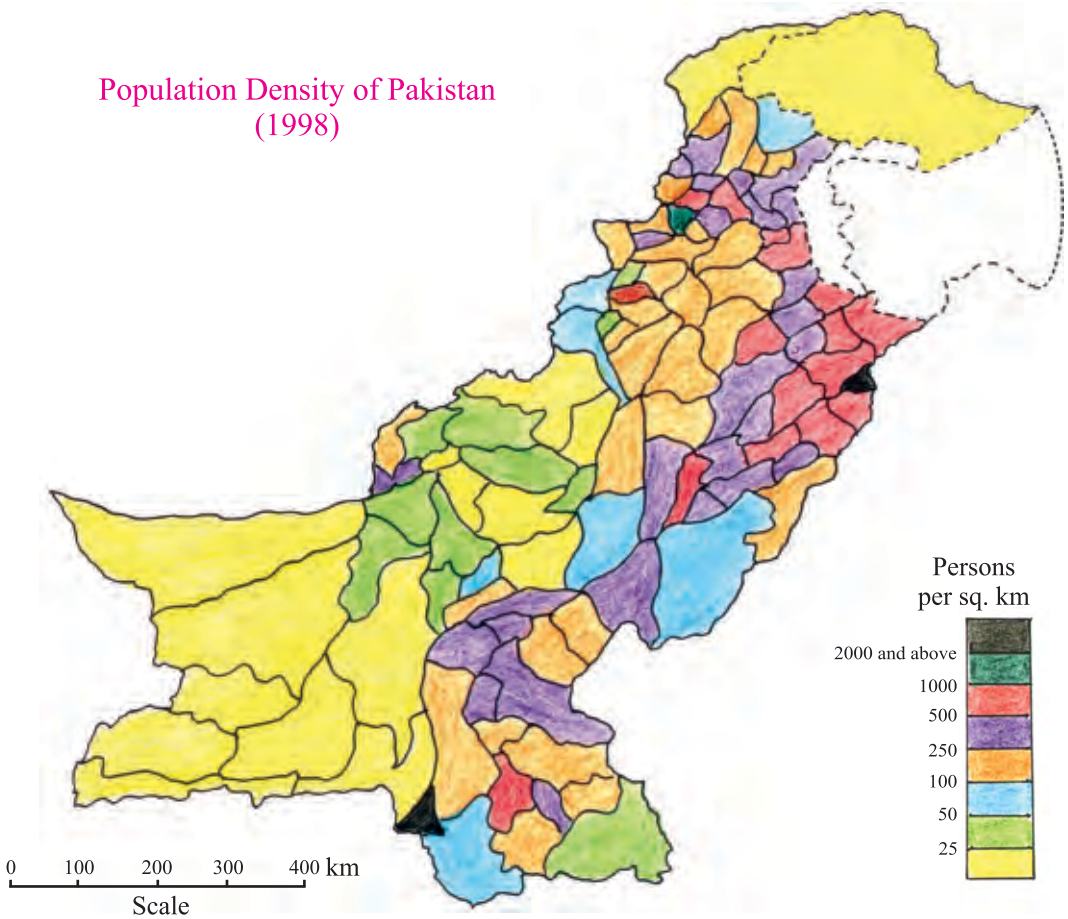


Density of population and more populated areas in Pakistan

	Area sq. km	Population (Million)	Density persons (per sq. km)	Density populated Area
Punjab	205345	102.51	499	Lahore,Faisalabad, Multan, Gujranwala, Rawalpindi
Sindh	140914	44.80	318	Karachi, Larkana, Mir Pur Khas, Hyderabad
Khyber Pakhtun khwa	74521	25.24	339	Peshawar, Charsadda, Mardan, Bannu, Abbottabad
Balochistan	347190	9.60	28	Quetta, Jafarabad, Qila Abdullah
FATA	27220	4.46	164	Bajaur, Khyber, Kurram and Mohmund Agency
Islamabad	906	1.41	1556	
Gilgit Baltistan	72971	1.8	25	Gilgit, Skardo, Dia Mir

Source: Economic Survey of Pakistan 2013-14

Population Density of Pakistan
(1998)



Structure of Population

The sex-age structure of Pakistan is as under:

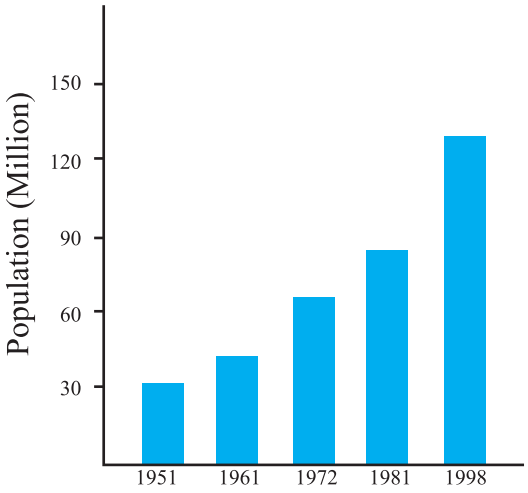
		Sex		Age		
Country	**Population (Million)**	**Male (%)**	**Female (%)**	**Children (%)**	**Youth (%)**	**Aged (%)**
Pakistan	191.71	51.35	48.65	37	59	4

Growth of population

At the time of creation of Pakistan, the population of present Pakistan (West Pakistan) was about 32.5 million. It is now about 191.71 million which is increasing at the rate of 1.92% annually.

Do you know?

The process of counting of population is called Census.



Population Growth of Pakistan

Problems of Population Growth

Pakistan is facing many problems because of fast growing population. Some of these problems are:

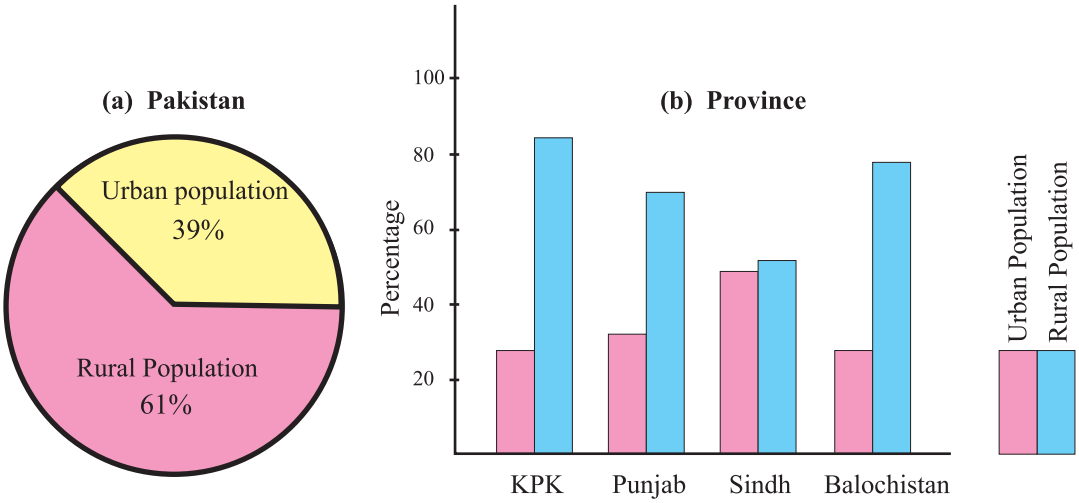
- Illiteracy
- Unemployment
- Lack of medical facilities
- Shortage of water and power
- Need to increase the crop production

Rural-Urban Population

Pakistan is basically an agricultural country. The main profession of the people is agriculture. That is why the major part of population lives in rural areas. However, people tend to move towards urban areas for better standard of life due to which the urban population is increasing. At present the percentage of rural population is about 61% and urban 39%.

Activity:

Observe the following graph and answer the questions.



The percentage of rural-urban population of Pakistan

(i) In which province the percentage of urban population is maximum?

(ii) In which province the percentage of rural population is maximum?

Internal Migration

Like other countries of the world, the trend of internal migration especially from rural to urban areas is increasing in Pakistan. People move towards cities for better standard of life. However, for the sake of peaceful environment, people also tend to choose sites away from the cities for residential purposes.

KEY POINTS

1. The distribution of population in the world is not uniform.
2. Some areas of the world are very densely populated, some moderately and some are least populated.
3. The trend of population growth is different in more developed and less developed countries.
4. People migrate due to different reasons.

GLOSSARY

Density:	The number of people per square kilometre
Migration:	The movement of people from one place to another
Census:	The process of counting of population
Demography:	The study of population

QUESTIONS

1. Tick (✓) the correct answer:

I. The percentage of world population living in Asia is about:

a. 6

b. 11

c. 14

d. 60

ii. What is the density of world population?

a. 10 persons /sq.km

b. 48 persons /sq.km

c. 212 persons /sq.km

d. 1000 persons /sq.km

iii. Which of the following countries has the maximum growth rate of population?

a. Australia

b. Liberia

c. South Africa

d. Pakistan

iv. In which of the following countries the percentage of old persons is maximum?

a. Liberia

b. Germany

c. Uganda

d. Japan

v. Which of the following countries has the minimum growth rate of population?

a. Niger

b. USA

c. Ugenda

d. Italy

vi. How many people are adding up annually in the world population?

a. 82 million

b. 50 million

c. 30 million

d. 3 million

vii. The least populated province of Pakistan is:

a. Punjab

b. Khyber Pakhtunkhwa

c. Sindh

d. Balochistan

viii. The percentage of females in the population of Pakistan is:

a. 60.25

b. 48.65

c. 30.65

d. 20.35

ix. Which province of Pakistan has the maximum urban population?

a. Sindh

b. Punjab

c. Balochistan

d. Khyber Pakhtunkwa

2. Give short answers:

i. Write the names of the least populated areas of the world.

ii. Divide population according to age groups.

iii. Write the names of four countries of high and low population growth

rate each.

iv. Write down the problems faced by Pakistan due to increase in population.

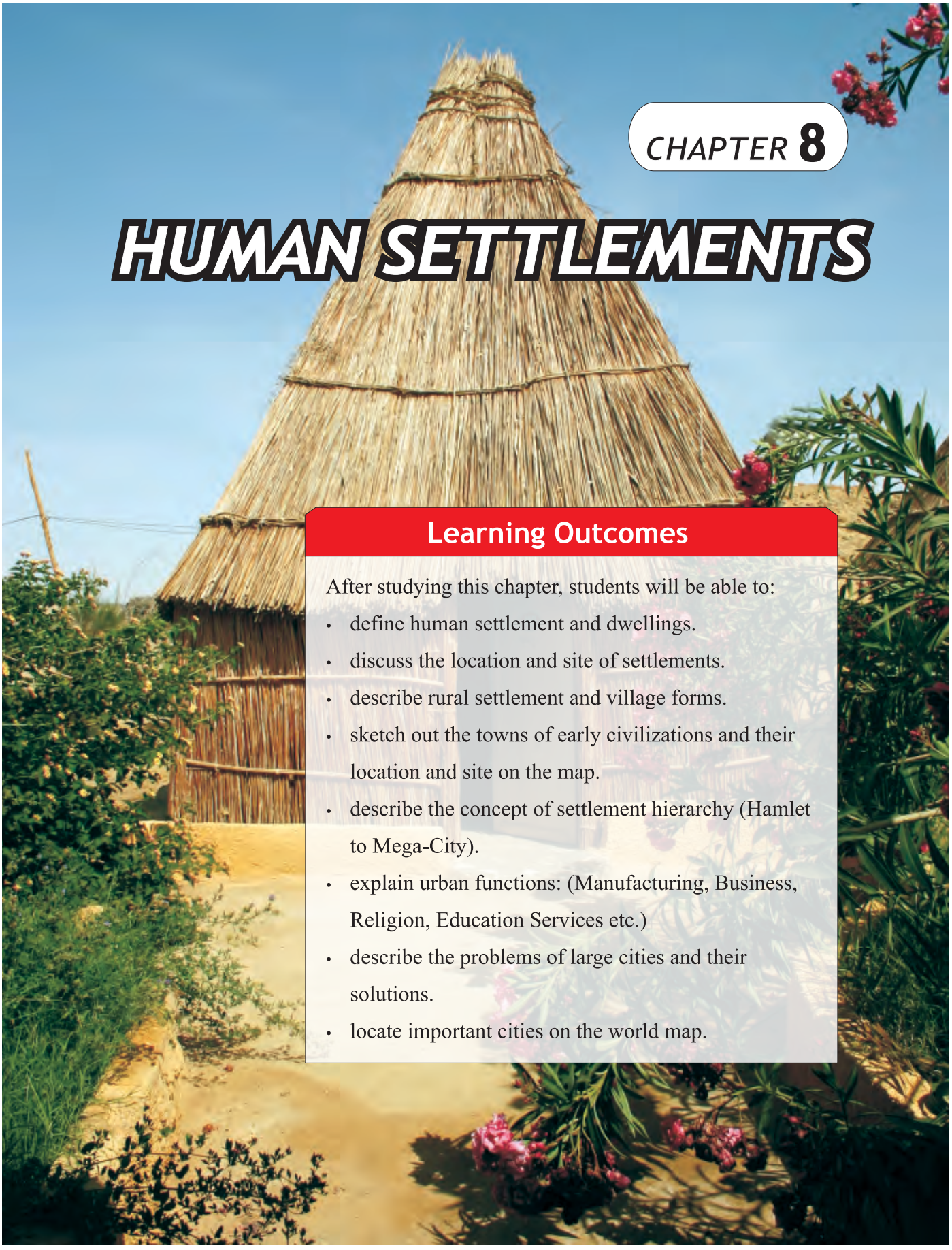
v. What is meant by population density?

3. Write a detailed note on the high density population areas of the world.

4. Write a note on the structure of population.

5. What is meant by migration? Also explain why people migrate?

6. Write a detailed note on the population of Pakistan.



CHAPTER 8

HUMAN SETTLEMENTS

Learning Outcomes

After studying this chapter, students will be able to:

- define human settlement and dwellings.
- discuss the location and site of settlements.
- describe rural settlement and village forms.
- sketch out the towns of early civilizations and their location and site on the map.
- describe the concept of settlement hierarchy (Hamlet to Mega-City).
- explain urban functions: (Manufacturing, Business, Religion, Education Services etc.)
- describe the problems of large cities and their solutions.
- locate important cities on the world map.

A. Settlement

Human beings used to live in caves in ancient times. That was the stone age when human beings wandered in search of animals to hunt with tools made of stone. With the passage of time, they learned the skill of growing crops. For this purpose, they had to leave the caves to get settled in the river valleys. This was the start of living together on permanent basis.

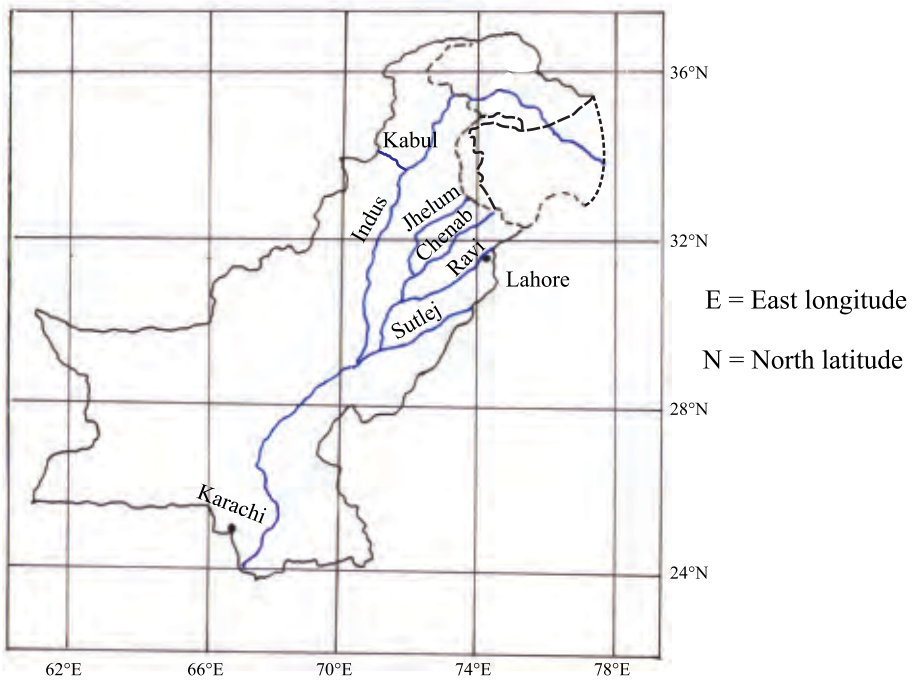
"A settlement is a place where human dwellings are made to live on permanent basis".

B. Location and Site of a Settlement

The location and site play an important role in the origin and growth of a settlement. Location tells us where the settlement is situated while site is the actual ground on which the settlement is established.

Activity:

Observe the following map. Location of Lahore can be described in two ways.



Map of Pakistan

i. Lahore is located at 31° north latitude and 75° east longitude.

ii. Lahore is situated on the eastern bank of the river Ravi.

From the beginning, human beings have preferred the following sites for settlement:

- In coastal belts
- In the confluence of two rivers
- Along river banks and islands
- Accessible by different means of transportation
- Meeting the requirement of basic necessities of life

C. Rural and Urban Settlements

According to the population and functions, there are two major types of settlements.

1. Rural settlements
2. Urban settlements

1. Rural Settlements

These are the primary settlements. The characteristics of these settlements are:

- They are small in size.
- They have small population.
- The majority of population is engaged in agriculture.
- They lack facilities of education, medical and recreation.

Types of Rural Settlements

According to form, there are many types of rural settlements, some of which are as follows:

i. Dispersed Settlements

The settlements in which houses are situated far from each other are called dispersed settlements.

Nucleated Settlement

Dispersed Settlement

ii. Nucleated Settlements

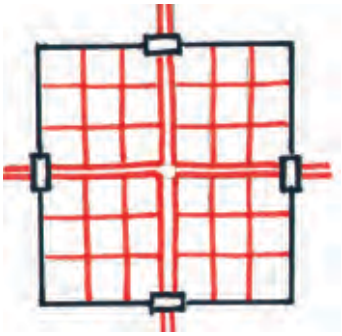
The settlements in which houses are situated side by side are called nucleated settlements.

iii. Linear Settlements

The settlements which are situated along a river or a road are called linear settlements. They are usually elongated in shape.

iv. Planned Settlements

The settlements in which the streets and road network follow a grid pattern are called planned settlements.



Planned Settlement

Nucleated Settlement

Linear Settlement

2. Urban Settlements

Foundation of urban settlements was laid when human beings mastered the skill of cultivation and got surplus production. The surplus production paved the way for trade which raised the standard of living of the people. This led to the change in the construction style of the houses and planned settlements began to appear.

In the following pictures those areas of the world have been shown where the earliest urban settlements came into being.

Tinochlitan (Mexico)

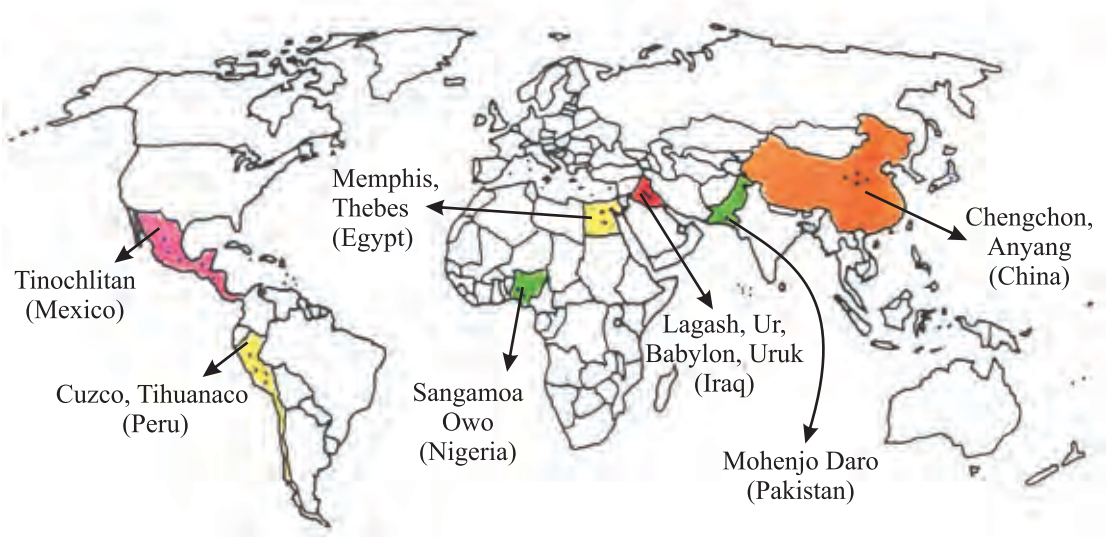
Ur (Iraq)

Mohenjo Daro (Pakistan)

Babylon (Iraq)

Now let us have a look on the characteristics of urban settlements:

Area	Years Ago (B.C)	Urban Settlements
Iraq	4000-3500	Lagash, Ur, Babylon, Uruk
Egypt	3000	Memphis, Thebes
Pakistan	3000-2000	Mohenjo Daro, Harrappa
China	2000	Chengchon, Anyang



The Ancient Urban Settlements of the World

Now let us have a look on the characteristics of urban settlements:

- They are large in size.
- They have a big population.
- Most of the people in the cities are engaged in different services, industry and trade.
- Basic necessities of life i.e. education, medical, commercial and recreational etc. are abundantly available in the cities.

- Urban settlements are nucleated settlements according to form.

D. Settlement Hierarchy

Settlements can be arranged according to their size and function. The bigger the size of settlement, the more will be the functions performed in it.

Let us have a look on this arrangement:

1. Hamlet

This is the smallest of the settlements. It is comprised of a few houses which are located far from each other and the land in between is used for cultivation. Such settlements are called hamlets

2. Village

Village is bigger than hamlet. It is comprised of many houses, which are constructed near the agricultural lands.

3. Towns

The settlement which is bigger than a village and smaller than a city is called a town. It has mixed characteristics of both village and city. Commercial areas, educational institutions, hospitals and government offices are present in towns. Besides agriculture is also practiced within the limits of the town.

4. City

A city is much bigger than a town and a village. It has a population in millions. Tall and huge buildings, schools, colleges, universities, hospitals, large commercial areas, offices, government institutions and recreational places are present in the cities.

5. Metropolitan City

Some cities of a country have special importance over the others. Some are capitals and some are important trading centres. These are called metropolitan cities. In Pakistan, the city with more than one million population is called a metropolitan city. Islamabad, Lahore and Karachi are metropolitan cities of Pakistan.

6. Megalopolis

The urban population of the world is speedily increasing. That is why the cities are getting bigger and coming close together. Such agglomeration of two or more big cities is called megalopolis.

Do you know?

The largest city of the country is called Primate city.

Think! Which is the primate city of Pakistan?

E. Urban Functions

The cities perform different types of functions. These are called urban functions. These functions increase with the size of the city. However, some cities are known by one of their functions. This is called specialized function.

Let us have a look on some specialized functions of the cities:

1. Some cities are capitals e.g., Islamabad, London, Washington etc. where the government machinery sits and runs the administration of the country. This is called **administrative function**.
2. Some cities are holy place e.g., Makkah, Jerusalem, Vatican City etc. and people from all over the world come here to perform religious functions. This is called **religious function**.
3. Some cities are known for their industrial development e.g, Sialkot, Pittsburg, London etc. Manufacturing of some items becomes their identification symbol. This is called **manufacturing function**.

4. Some cities are major commercial centres, e.g. Dubai, Hong Kong, Singapore etc. People from all over the world come here for sale and purchase of goods. This is called **commercial function**.

5. Some cities are known for their educational institutions e.g. Oxford, Aligarh, Lahore etc. Students from all over the world, come here to seek knowledge. This is called **educational function**.

6. Some cities are tourist resorts where people from all over the world come to spend their holidays e.g. Northern areas of Pakistan, Manila, Paris, Cairo etc. This is called **recreational function**.

F. Important Cities of the World

Lets have a look on some important and big cities of the world.

1. Karachi

Karachi is the largest city of Pakistan. It is situated on the coast of Arabian Sea in the south of Pakistan. It is a big commercial centre and a famous port. Foreign trade is done through Karachi.

Quaid-e-Azam Muhammad Ali Jinnah, the founder of Pakistan was born in Karachi. His tomb is in Karachi, too.

2. Mumbai

It is the largest city of India. It is also situated on the coast of Arabian Sea in the west of India. It is an important commercial centre and a famous port.

3. Shanghai

It is the largest city of China. It is situated on the coast of Pacific Ocean in the east of China. It is a famous manufacturing and commercial centre and a busy port.

4. Tokyo

It is the largest city of Japan. It is situated in eastern Japan near the coast of Pacific Ocean. Tokyo along with Yokohama is a big manufacturing centre. Yokohama serves as a port for Tokyo. It is also the capital of Japan.

5. New York

It is the largest city of United States of America. It is situated on the coast of Atlantic Ocean in the east of USA. It is an important manufacturing and commercial centre and a busy port. More than 50% foreign trade of USA is done through New York.

6. London

It is the largest city of England. It is situated in southern England on the bank of the river Thames. It is a famous manufacturing and commercial centre and an important railway junction. Heathrow airport in London is one of the busiest airports in the world.

7. Makkah

Makkah is a big city of Saudia Arabia. It is situated in the western part of Saudia Arabia. Khana Kaaba is situated in Makkah. That is why it is the focus of the Muslim World. Muslims from all over the world come here for Hajj every year.

Major cities of the world

G. Problems of Major Cities

Let us have a look on the problems of large cities:

1. Due to high population density, the problems of people are increasing.
2. Excessive use of fossil fuels in industries and transporation is causing air pollution.
3. The burning of fuels and the use of concrete in the buildings is increasing the air temperature of the cities.
4. The rush of traffic during office and school timings results in traffic jam which is wastage of time.
5. Due to increase in population, open spaces for waste disposal outside the cities are being utilized for residential purposes. That is why disposal of waste is becoming a major problem in big cities.
6. Lack of parks and trees affect the air quality as well as the proportion of oxygen.
7. Social crimes increase due to unemployment and inflation.

What is the solution of these problems?

Let us try to find out the solution of these problems:

1. New housing schemes to be planned to cope with the problem of increasing urban population.
2. Alternative sources of energy i.e., solar and wind power to be preferred over fossil fuels to avoid increase in temperature and pollution.
3. More trees to be planted on road sides to improve air quality and to maintain the temperature.
4. Cycling to be encouraged during the office and the school timings, as practised in China.

5. Waste and water to be recycled as is the case in Japan and other European countries.

6. Playgrounds and parks to be planned in densely populated areas to improve air quality.

7. Awareness about neat and clean environment be given to the people.

KEY POINTS

1. Settlement is a place where human dwellings are made to live on permanent basis.

2. The location and site of settlement play a vital role in its growth.

3. According to the form, there are many types of settlements.

4. We can classify settlements according to functions.

5. Urban settlements perform specialized functions.

6. Karachi, Mumbai, Shanghai, Tokyo, New York, London and Makkah are important cities of the world.

7. There are major problems of living in a big city.

GLOSSARY

Dispersed Settlements:	The settlements in which houses are situated far from each other
Nucleated Settlements:	The settlements in which houses are situated side by side
Linear Settlements:	The settlements situated along a river or a road
Hamlet:	The smallest unit of settlement
Metropolitan City:	Administrative or a big commercial city
Megalopolis:	Agglomeration of two or more big cities

QUESTIONS

1. Tick (✓) the correct answer:

I. Lahore is situated on the bank of river:

a. Indus b. Jhelum

c. Chenab d. Ravi

ii. The ancient city "Babylon" is situated in:

a. China b. Pakistan

c. Iraq d. Mexico

iii. The settlements situated along the river are:

a. Rounded b. Linear

c. Square d. Dispersed

iv. Mohenjo Daro is the ancient city of:

a. Pakistan b. Iraq

c. Egypt d. China

v. The settlement in which houses are located far from each other, is called:

a. Magapolis b. Hamlet

c. Town d. Village

vi. Makkah, Jerusalem and Vatican City are:

a. Commercial Centres b. Capitals

c. Holy Places d. Tourist Places

vii. The capital of Japan is:

a. Karachi b. New York

c. Tokyo d. London

viii. One of these is situated on the coast of Pacific Ocean:

a. London b. Makkah

c. Shanghai d. Karachi

ix. One of these cities is not a port:

a. Karachi b. Mumbai

c. Makkah d. New York

x. The settlement which is bigger than village and smaller than city is called:

a. Town b. Metropolitan City

c. Hamlet d. Megalopolis

2. Give short answers:

i. What is meant by Location and Site of a settlement?

ii. Write two characteristics of Rural and Urban settlements?

iii. Write down the name of the earliest urban settlements of the world.

iv. Write a short note on Makkah.

v. Write down four problems of large cities.

3. Discuss the types and characteristics of rural settlements.

4. Write a detailed note on settlement hierarchy.

5. What is meant by urban functions? Also write a detailed note on the specialized functions of a city.