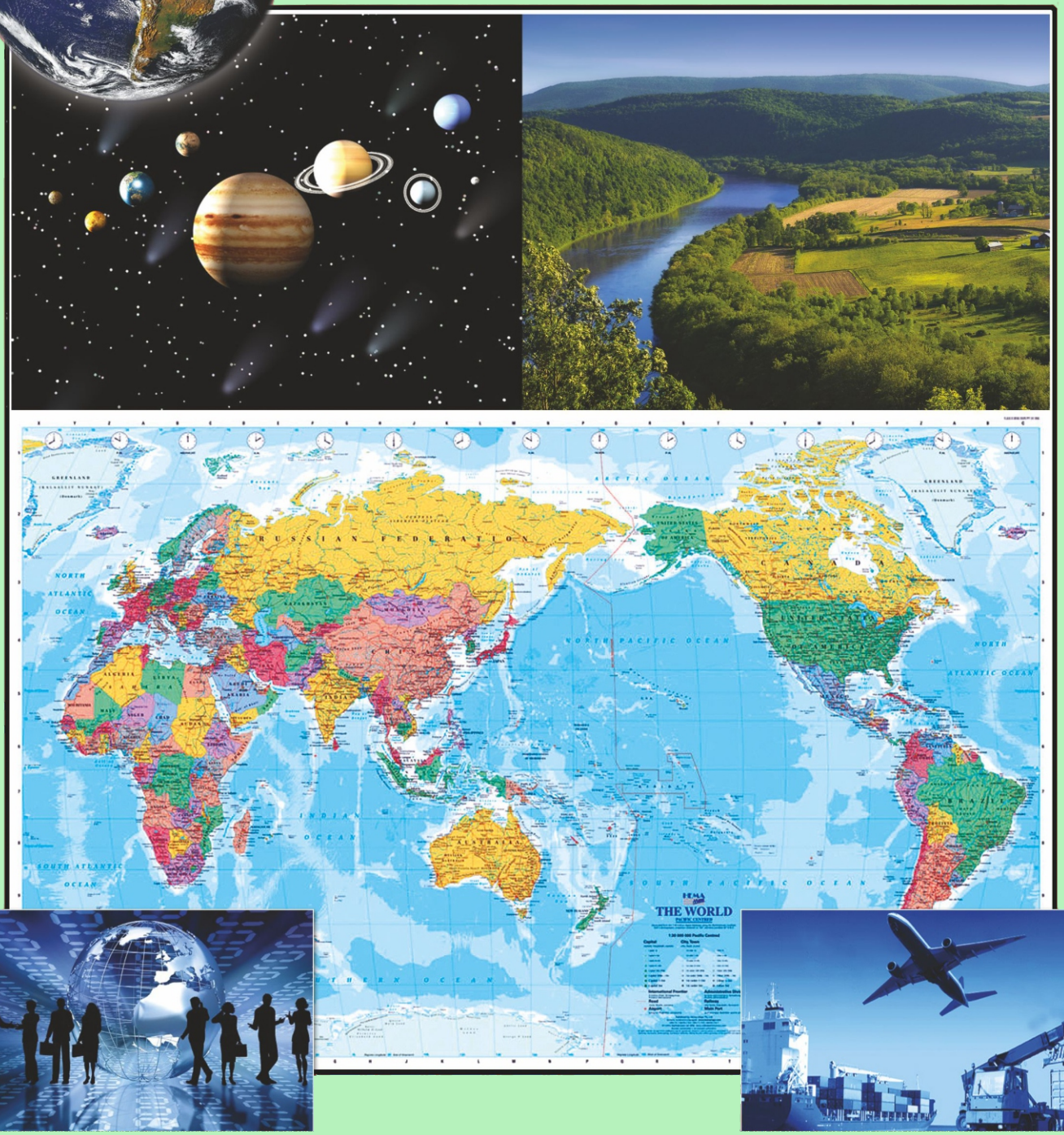
Social studies

Geography

Level C



ENGLISH

Pratham Open Basic education

(Text Book)

Context

Pratham has been registered with the National Institute of Open Schooling NIOS, Delhi under the Open Basic Education programme (OBE) Registration no. OB1100502 since the year 2002. Pratham carries out the academic and administrative functions of this programme.

The NIOS board introduced the OBE programme as an alternative educational programme, equivalent to the Elementary Education Programme of the formal education system. Over the years, since the inception of the programme, Pratham identified children who were out of the education system and needed a platformto be included. We acknowledged the need to adapt the current curriculum to suit the needs of all children. Keeping in mind the NCERT, State Board, and NIOS guidelines, this adaptation is aimed to provide children with an opportunity to equal and approachable learning.

Note : The current developed content is in sync with the curriculum guidelines developed and designed by the NIOS Board. The representative images in thisbook have been taken from google images. We thank and give credit for theimages to Google. In case of any changes, the POS team will inform registeredschools and individuals accordingly.

Foreword

The team has worked very hard to put this curriculum together. I hope that children will find this curriculum simple and friendly. The teachers using thiswill surely benefit. This syllabus would not have been possible without the teamwork of all the individuals who are experts in their own fields.

A committee was constituted to affirm and ascertain the quality and validate the Pratham Open Basic Education content for wider use. This committee has reviewed the content, design and applicability.

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Lesson - 1

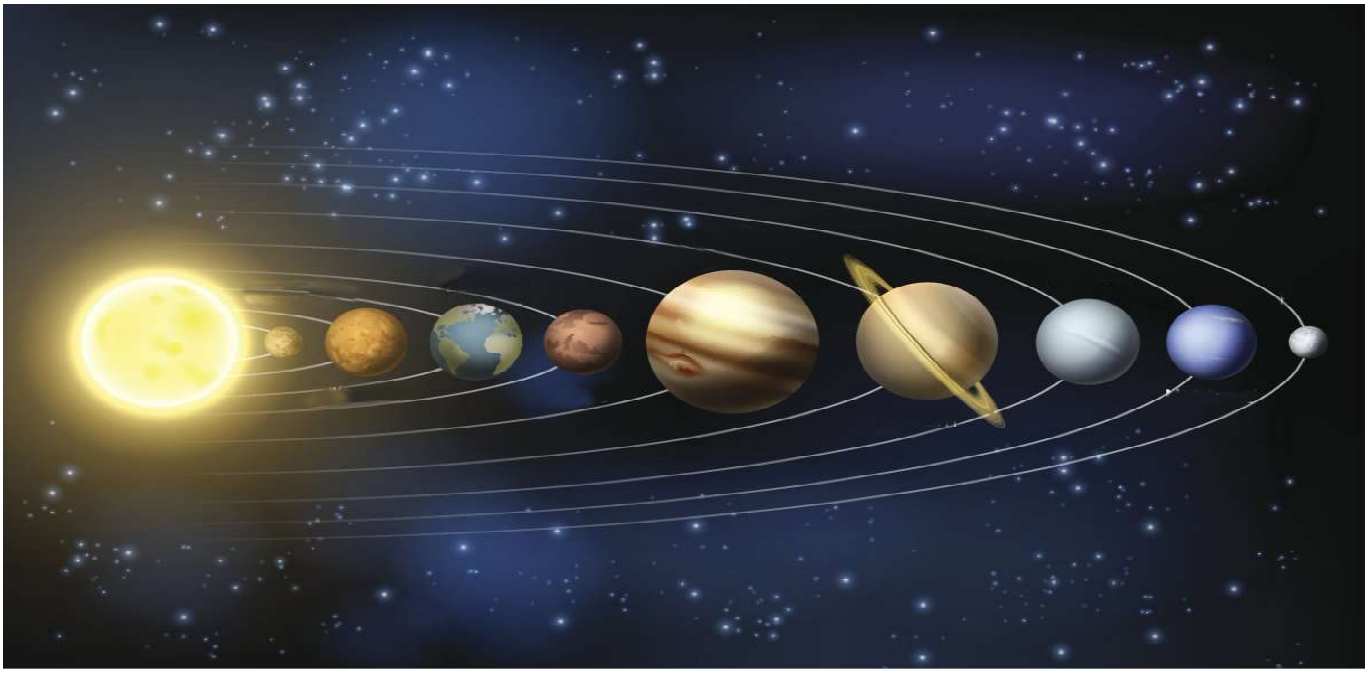
The Solar System

The Solar System

The stars and planets are generally spherical in shape. Celestial means the sky. Therefore, the spherical bodies in the sky are known as celestial bodies or heavenly bodies. The science which studies the heavenly bodies like stars, planets, etc. is called astronomy.

The Solar System : Constitutes of :

1) Eight planets including the earth, satellites, asteroids, dwarf planets, comets, meteors and the sun together constitute our solar system.
2) The names of the planets in the solar system are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune



The Sun :

The sun is the head of the solar system. It is made up of extremely hot gases. All the members of the solar system get heat and light from the sun.

The Earth :

The planet on which we live is known as the earth. Life on earth owes its existence to a favorable atmosphere and presence of water on this planet. The earth follows a specific path when it goes round the sun. This path is known as its orbit, and the motion of going round on this path is called revolution.

Points to remember :

- Spherical bodies in the sky are known as celestial bodies or heavenly bodies.
- Science which studies the heavenly bodies like stars, planets, etc. is called astronomy.
- The sun is the head of the solar system and it is made up of extremely hot gases.
- The path which our planet earth follows when it goes around the sun is known as its orbit and the motion of going round on this path is called as revolution.

Key words :

Celestial	Satellites	Asteroids
Dwarf	Meteors	Revolution

Lesson - 2

The Earth

Now-a-days, the earth can be photographed from different angles, with the help of artificial satellites and spaceships. In ancient times, it was not possible to get such pictures even then; scientists guessed that the shape of the earth may be round.

As man began to make voyages, he got some more experiences which confirmed his opinion that the earth is spherical. As his boat or ship left the shores and he went further away from the land, he noticed that the people and houses nearest to the shore disappeared first, but the distant hills and mountains could be seen till he had travelled some more distance. On the other hand, while sailing towards the shore, he noticed that the distant hills and mountains were seen first and then the houses and the people. Had the earth been flat, he would have seen everything at the same time. At the most, distant objects would have looked smaller in size or hazy. He got the same experience during different voyages, in different parts.

This helped him to conclude that the earth is round from all the sides. However, the earth is not a perfect sphere. Its shape at the poles is slightly flat and it bulges at the equator. The earth rotates on its axis and it is this that has led to the bulge at the equator and the relative flatness at the poles. The earth's equatorial diameter is 12,756 km and its polar diameter is 12,714 km.

Points to remember :

- The earth can be photographed from different angles, with the help of artificial satellites and spaceships.
- Earth is spherical. However, it is not a perfect sphere. Its shape at the poles is slightly flat and it bulges at the equator.
- The earth rotates on its axis.
- The earth's equatorial diameter is 12,756km and its diameter polar is 12,714km.

Keywords :

Spaceships	Spherical	Voyages
Equator	Axis	Equator

Lesson - 3

Motions of the Earth and their effects

Axial Motion :

Any object which rotates around itself is said to be rotating around its axis. Actually, the axis forms due to the rotation. Take a flat wheel and spike through its centre. Spin the wheel by turning the spike. The wheel starts spinning with the spike as its axis. Now take a ball and spin around an axis, which we cannot see. We have to imagine the ball's axis. The earth, too, spins like the ball and though we cannot see its axis, we can imagine it.

The earth's motion around it's axis is called it's axial motion and the spinning motion is called it's rotation.

Effects of the Axial motion :

1. Creation of an axis.
2. The bulging of the earth at the equatorial region and it gets flatter at the poles.
3. Occurrence of day and night on the earth.
4. Change in the direction of the winds and ocean currents. Phases of time like sunrise, noon, sunset and midnight are possible on the earth because of it's rotation.

Orbital Motion :

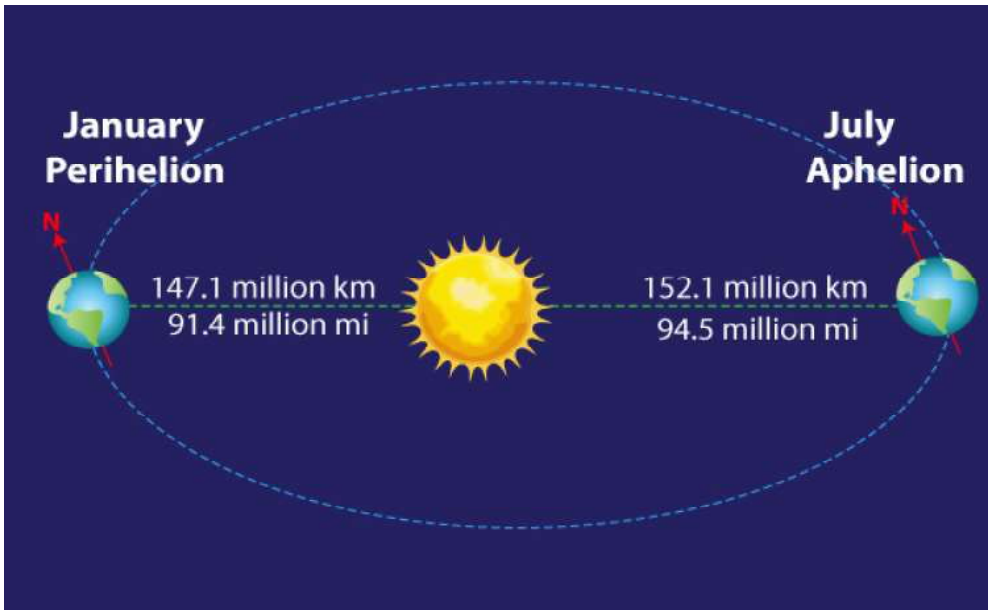
The earth follows a particular path when it goes around the sun. This path is known as it's orbit and the motion of going around on this path is called revolution or orbital motion.

The path of revolution is elliptical. A circle has only one centre but an ellipse has two centers. At one centre is the sun. It never changes its place because the earth's orbit is elliptical.

It's distance from the sun changes along the path. When the earth is nearest to the sun, it is said to be in the perihelion position. When it is farthest from the sun, it is said to be in the aphelion position. Look at the figure given below to understand these states. As the difference between the two positions is small, it does not affect the climate on the earth.

The plane of the earth's orbit :

Imagine a line joining the centers of the sun and the earth. If we move this line as the earth revolves in its orbit, we get a flat surface. This surface is called the plane of the earth's orbit as the earth moves around the sun; the sun is within the orbital plane of the earth. The earth's axis makes an angle of 66^0 30' with the plane. That is, the axis is inclined at an angle of 23^0 30' from its upright position.



Effects of the orbital motion of the earth :

1. The time that the earth takes to revolve around the sun is called a year. We can measure time in years because of the earth's revolution. This is possible due to its orbital motion.
2. Another effect of the earth's orbital motion is seasons on the earth.

Points to remember :

- The earth's motion around its axis is called its axial motion and the spinning motion is called its rotation.
- Phases of time like sunrise, noon, sunset and midnight are possible on the earth because of its rotation.
- The path of the earth's revolution is elliptical.
- When the earth is nearest to the sun, it is said to be in the perihelion position. When it is farthest from the sun, it is said to be in the aphelion position.
- The time that the earth takes to complete one revolution around the sun is called a year.
- One of the effects of the earth's orbital motion is seasons on the earth.

Keywords :

Spinning	Bulging	Rotation
Elliptical	Perihelion	Orbit
Aphelion		

Lesson - 4

The Atmosphere

The envelope of air around the earth is known as the atmosphere. The atmosphere does not have color, smell or taste.

Composition of the atmosphere :

The atmosphere is mainly made up of certain gases, water vapor and dust particles.

A) Gases : There are several different gases in the atmosphere. The main gases are nitrogen and oxygen.

B) Water Vapor : Water from water bodies evaporates due to the heat of the sun and mixes with the air. There is more water vapor in the lower layers of the atmosphere.

C) Dust Particles : Due to burning of fuel, transport, construction work, mining, storms, volcanoes, etc. innumerable dust particles are added to the atmosphere. There are more dust particles in the lower layers of the atmosphere.

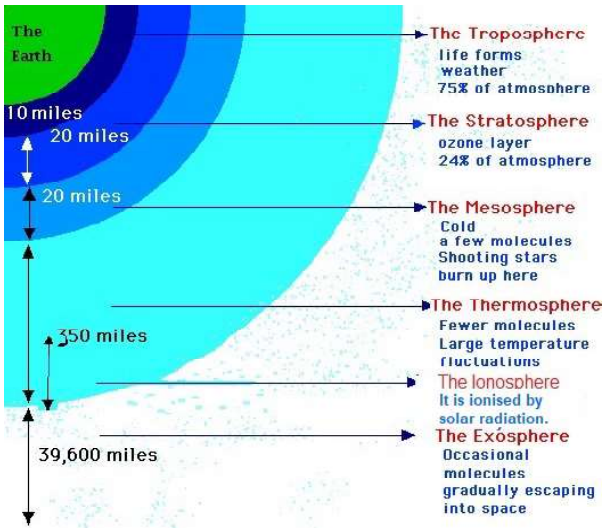
Structure of the atmosphere :

The different layers of the atmosphere are divided according to height of the layers.

1. **Troposphere :** The layer which is closest to t he earth's surface is called the troposphere. Storms, cloud and rain are all formed in this layer. In the region at the top of the tropo sphere, temperature does not change. It remains constant. This region is known as the tropopause. The tropopause is about 3 km in thickness.
2. **Stratosphere :** The quantity of vapors, dust particles, etc. in this layer is very small. In the lower part of the strato sphere, there is a layer of ozone. The ultra-violet rays from the sun

are very harmful to living organisms. The ozone layer ab sorbs these rays and thus protects the living organisms. Above the stratosphere is the mesosphere.

3. **Mesosphere :** The lowest temperature in the atmosphere is recorded in this layer.
4. **Thermosphere :** The highest layer of the atmosphere is known as thermosphere. Light gases like hydrogen, neon etc are found in this layer.
5. **Ionosphere :** It is part of the atmosphere between thermo sphere and exosphere, it is ionised by solar radiation. Ra dio waves are reflected from this layer. Hence, this layer is useful for telecommunication.



Importance of the atmosphere :

The atmosphere safeguards the living organisms like a protective shell. It also helps to control the temperature of the earth.

Causes of pollution : Carbon dioxide and other poisonous gases are produced by burning the fuel. This pollutes the air. Refrigerators and other gadgets release gases that can harm the ozone layer. All this leads to global warming which has endangered the living world. Hence, it is necessary to take the precaution, and avoid polluting the atmosphere. Wherever possible trees should be planted and protected.

Modern instruments, vehicles should be used only in emergency. Instead of private vehicles, buses and trains should be used. Only then will our existence be sustained.

Points to remember :

- The envelope of air around the earth is known as the atmosphere.
- The layer which is closest to the earth's surface is called the troposphere.
- Tropopause is the region at the top of the troposphere where the temperature does not change.
- In the lower part of the stratosphere, there is a layer of ozone which absorbs the harmful rays from the sun and thus protects the living organisms.
- Light gases like hydrogen are found in Thermosphere.
- The atmosphere is important as it safeguards the living organisms. It also helps to control the temperature of the earth.

Keywords :

Atmosphere	Nitrogen	Oxygen
Troposphere	Stratosphere	Mesosphere
Ionosphere	Thermosphere	

Lesson - 5

Biosphere

The space occupied by living world on the earth is called the biosphere. Hydrosphere, lithosphere and atmosphere are the non-living elements of the earth whereas the biosphere is a living element of the earth.

Elements of the biosphere :

Plants, animals and micro- organisms are the elements of biosphere. Plants get the nutrients necessary for their growth from the soil. With the help of solar energy (sun light), plants make food for themselves. Deer, rabbits, elephants etc. animals use plants as their food. Animals like lion, panther, tiger, etc. depend upon herbivorous animals for their food. Micro–organisms depend upon living or dead plants and animals for their food. Living beings in the biosphere are interdependent.

Limits of biosphere :

There is scarcity of oxygen in the atmosphere as we go higher and higher in the sky. Also the air pressure, temperature and moisture decreases there. We find living things up to a certain limited height in the atmosphere. Upto a limited area, there is a condition suitable for living beings to live on the earth. It also includes insects and micro-organisms. Oceans and seas also conserve living beings up to some extent in maximum or minimum numbers. We find living beings in the atmosphere up to a limited height and under the earth up to a limited depth. A number of living being live under the surface of the earth.

Classification of living organisms :

All living organisms are a part of the biosphere. They are classified as follows on the basis of how they get the food needed for their existence.

1. **Plants :** Produce their own food. Natural vegetation in a region depends upon the rainfall, type of soil, as well as the duration and intensity of sunlight.
2. **Animals :** Depend on plants directly or indirectly for food. Evenhuman beings also depend on plants and other animals for their food.
3. **Micro-organisms :** Depend on plants and all other living beings for their food. Micro-organisms decompose the remains of dead plants and animals.

Completely dependent on others (Heterotrophs) :

Some plants and animals completely depend on other living things for their food. They are called as heterotrophs. They do not make their own food on their own. E.g. Plant like Cuscuta (Amarbel)- a kind of creeper completely depends on other living things for its food.

Autotrophs :

Some plants do not depend on other living things for their food. They make their food on their own without depending on other plants or animals. Such plants are called autotrophs e.g. Most of the plants are autotrophs.

Points to remember :

- Space occupied by living world on the earth is called the biosphere.
- Plants, animals and micro-organisms are the elements of biosphere.
- Some plants and animals completely depend on other living things for their food. They are called as heterotrophs.
- Some plants do not depend on other living things for their food. Such plants are called as autotrophs.

Keywords:

Biosphere	Hydrosphere	Lithosphere
Nutrients	Micro-organisms	Scarcity
Heterotrophs	Natural Vegetation	Autotrophs.

Lesson - 6

Biosphere - 2

The space occupied by the living world on earth is called biosphere.

Soil : the layer of earth which is essential for plant life and which provides them with nutrients for growth is called soil. Soil is a uniform mixture of fine particles of weathered rock, decayed organic matter and innumerable micro-organisms.

Importance of soil :

Soil is a natural resource.

1. Plants make food for them and are used as food for others. Plants get the nutrients they need form the soil.
2. The process of decomposition of the remains of dead plants and animals take place in the soil.
3. The agricultural productivity of any region depends on the fertility of the soil.

We take various measures such as irrigation, use of chemical fertilizers and pesticides in order to increase agricultural production, but if these are used in excess, they reduce the fertility of the soil. This means that they degrade the soil. The efforts to bring maximum land under cultivation, over exploitation of farm land, improper methods of farming, excessive cutting down of forests, all of these cause soil erosion. And this results in reducing the productivity of the land. That is why it is extremely necessary to make proper use of the soil, reduce its erosion, and to use organic fertilizer to preserve soil fertility.

Plants :

Natural vegetation is mainly classified in the following types :

1. Forest 2. Grasslands 3. Arid lands

1. Forests :

Many types of inter-dependent plants such as trees, shrubs, creepers and grasses growing together are collectively known as a forest. This includes equatorial evergreen forests, Tropical deciduous forests, temperate coniferous forests and different types of mixed forests.

Forest areas are the habitat of various animals. We observe a lot of bio-diversity in forests. Equatorial forests show maximum bio-diversity, as this region receives rainfall all the year round and has a longer duration of bright sunlight.

As we move away from the equator, the period of rainfall is reduced and it occurs only in specific seasons. As a result, it is less effective. Plants need to shed leaves in the period when water is scarce. That is why we get deciduous forests in such areas. In equatorial evergreen forests, we find rhinos, bison, tigers, elephants and other animals. Coniferous forests are also evergreen, but there is less bio-diversity in these forests. At times, you may find forests of the same type of tree extending over long distances.

2. Grasslands :

Grasslands are found in the tropical and temperate zones. In both these zones, the number of trees has greatly reduced due to low rainfall and deforestation. Water being available only for a limited period, the life cycle of plants are also limited. That is why; we find mainly grasses and small shrubs here.

Tropical grassland abounds with animals. The grasses, too, are very tall and thick. A variety of grass called 'elephant grass' can hide even elephants. We see many herbivorous animals like different types of deer, bisons, zebras and giraffes as well as carnivorous animals like lion, foxes and wolves in these areas.

The grass in the temperate grasslands is not so tall. Here we find short trees and shrubs. A variety of grass called buffalo grass is mainly seen. These grasslands stretch over extensive areas in the mid-latitudinal zone. We find horses, bisons, foxes, hyenas, wolves etc.

3. Deserts : Regions with a total lack or scarcity of living organisms are known as deserts. As the environment in such regions are not favorable for life, life forms are scarce and so is human habitation.
Deserts are classified into hot deserts and cold deserts.

A. Hot Deserts : Water is scarce in such areas. As a result, only plants that can cope with long, dry seasons are seen in hot deserts. They include thorny trees like acacia and various types of cactus.

In order to reduce the loss of moisture through transpiration, these plants remain leafless for a long period during the year. Animals in these regions include horses, camels, ostriches, foxes, hyenas, lions, snakes, scorpions etc.

B. Cold Deserts : These are located in the Polar Regions and very high snow-covered mountains. In the polar region, sunlight is not very strong and the ground remains frozen for a long period. The plants here include algae, lichen, etc.

The plants here blossom only for a few weeks in summer. All this time, polar bears, reindeer, caribou and such other animals from the coniferous forests visit these areas. In winter, they return to the coniferous forests.

Animals :

Depending on the climate and the natural vegetation, we find different types of animals in different regions of the world. They can be classified according to their habitat and diet.

1. Classes based on the habitat :

a. Wild animals : Animals that live in forests and lead a natural life are known as wild animals. They mainly include tigers, lions, wolves, foxes, elephants, rhinos, giraffes, bears, snakes and many types of birds.

b. Domesticated animals : Man has domesticated certain animals for his benefit. We obtain products like milk, eggs, meat, wool, hide, bones etc. from them. Some are used as farm animals and beasts of burden. We keep some animals for protection, and some, for entertainment. They are all knowas domesticated animals.

2. Classification based on diet :

a. Herbivorous animals : Animals that eat food of plant origin are called herbivorous animals. They are cows, buffaloes, deer, rabbits, camels, elephants, etc.

b. Carnivorous animals : Animals that eat the flesh of other animals are called carnivorous animals. They mainly hunt herbivorous animals. Carnivorous animals include tigers, lions, snakes, kites, etc. Some animals like vultures are scavengers, i.e. they live on the remains of dead animals.

c. Omnivorous animals : Animals that eat foods of both plant origin as well as of animal origin are called omnivorous animals. For example, man, rat, crow, etc.

If the number of a plant or an animal reduces significantly or increases excessively in a region, it may disturb the balance of an environment.

Herbivore *Carnivore* *Omnivore*

Points to remember :

- The layer of earth which is essential for plant life and which provides them with nutrients for growth is called soil.
- Soil is a natural resource.
- Natural vegetation is mainly classified into forests, grasslands and arid lands.
- Many types of inter-dependent plants such as trees, shrubs, creepers and grasses growing together are collectively known as a forest.
- Grasslands are found in the tropical and temperate zones.
- Regions with a total lack or scarcity of living organisms are known as deserts.
- Hot deserts are located in a zone of subsiding or sinking air.
- Cold deserts are located in the polar region and very high snow-covered mountains.

- Animals that live in forests and lead a natural life are known as wild animals.
- We keep some animals for protection, and some, for entertainment. They are all known as domesticated animals.
- Animals that eat food of plant origin are called herbivorous animals.
- Animals that eat the flesh of other animals are called carnivorous animals.
- Animals that eat foods of both plant origins as well as of animal origin are called omnivorous animals.

Keywords :

Weathered rock	Omnivorous
Decomposition	Irrigation
Carnivorous	Pesticide
Soil Erosion	Soil fertility
Grasslands	Arid lands
Coniferous	Torrid
Temperate	Carnivorous
Cactuses	Moisture
Herbivorous	Elephant grass
Chemical fertilizer	Decayed organic matter

Lesson - 7

Hydrosphere

Around 71% of the earth's surface is occupied by water. This is called hydrosphere. The hydrosphere is made up of oceans, seas, bays, gulfs, straits, lakes, etc. all taken together. River and the areas under ice cover also form a part of the hydrosphere.

Ocean : The vast storages of saline water that spread between the continents are called oceans. The Pacific, the Atlantic, the Indian and the Arctic are the four major oceans.

Sea : A large store of saline water that is partially or totally surrounded by land is called a sea. E.g. the Arabian Sea, the Caspian Sea, etc.

Gulf *Creek* *Lake*

Bays : A smaller portion of the sea that extends into land areas are called bays. E.g. Bay of Bengal.

Strait : A narrow portion of oceanic water that joins two larger water bodies is called a strait. E.g. the strait of Malacca.

Sea *Bay* *Strait*

Gulf : The oceanic water that extends into land area and generally has a tapering shape is called a gulf. E.g. the Gulf of Kutch, the gulf of khambhat, the gulf of California etc.

Creek : During high tides, sea water moves up the river mouth. The portion of the river channel upto which the sea water extends is called a creek. E.g. Vasai creek.

Lake : Water bodies that occur naturally in the low-lying portion of land are called lakes. E.g. Dal and Sambhar Lake.

Importance of Oceans : The importance of oceans in human life can be explained as follows **:**

1) Oceans and natural resources

1. Oceans have a wealth of biotic resources. These mainly include different types of fish and various types of marine flora (vegetation)
2. We get precious items like pearl and coral as well as decorative items like shells from the oceans.
3. In the coastal area, salt is obtained from saline waters in salt pans.
4. Minerals like iron ore and petroleum are obtained from the ocean floor.
5. The scarcity of potable water can be reduced by converting the saline ocean water into potable water.
6. In future, the oceans are likely to become a major source of energy. Waves, tides and currents will be utilized for harnessing energy.

Therefore, oceans are called the storehouse of resources.

2) Oceans and climate

1. We get the fresh water needed for the various needs of human life as precipitation through the water cycle.
2. Oceans are considered to be a factor controlling climate. The climate of the coastal area is equable because of its closeness to the sea.

3) Oceans and transportation

1. Oceans have provided a very cheap alternative for transportation.
2. The ports and harbors along the coastline facilitate transportation activity as well as fisheries.
3. Industries like building and maintenance have flourished.

4) Marine boundaries and defense

Coastlines play a major role in defense strategies. For a country like India which has a coastline, seas are the natural boundaries.

Oceans and environmental issues :

Now-a-days, the oceanic waters are getting polluted on a large scale. The leakage of oil from oil transporting ships, oil extraction from coastal areas, disposal of solid waste containing radioactive matter, atomic tests, the effluents brought by river discharges, the disposal of waste from industries, etc. are polluting the oceanic waters. As a result, the very existence of marine life is threatened. The earth is called a water planet. A large part of the water is in the form of solid ice. This water is showing signs of melting. In different parts, the sea level is rising. These are the consequences of increasing pollution and global warming. Scientists are showing concern about the possibility of large parts of the coastal tracks getting submerged in future. There is an urgent need of making the entire human race aware about it.

Points to remember :

- Around 71% of the earth's surface is occupied by water. This is called hydrosphere.
- The vast storages of saline water that spread between the continents are called oceans.
- Oceans are called the storehouse of resources.

- A large store of saline water that is partially or totally surrounded by land is called a sea.
- A smaller portion of the sea that extends into land areas is called bays.
- A narrow portion of oceanic water that joins two larger water bodies is called a strait.
- The oceanic water that extends into land area and generally has a tapering shape is called a gulf.
- During high tides, sea water moves up the river mouth. The portion of the river channel upto which the sea water extends is called a creek.
- Water bodies that occur naturally in the low-lying portion of land are called lakes.
- Oceans are considered to be a factor controlling climate.

Keywords :

Bays	Gulfs	Creek
Saline water	Biotic	Salt pans
Potable water	Precipitation	Oil extraction
Radioactive matter		

Lesson - 8

Movements of Ocean Water

Ocean waters are dynamic in nature. The movements of ocean water are caused by **:**

1) Various characteristics of ocean water like temperature, density and salinity.
2) Gravitational attraction of the sun, moon and the rotation of the earth.
3) Earthquakes and volcanic eruption occurring at the ocean floor, etc. Waves, tides and ocean currents are the three main forms of ocean water movements.

1) Sea Waves : The wind pushes sea-water. As a result of the impact of wind energy, the sea water gains momentum and ripples develop on its surface. These are called sea –waves. As a result of the waves, sea- water moves up and down and slightly to and fro. Waves transmit the energy contained in them towards the coast. On entering the shallow water in the coastal zone, they break.

Velocity of waves : If you throw a floating object at a sufficiently long distance in the sea, you will find that the object keeps on moving up and down at the same place, it does not move towards the coast. This means that the water in the wave does not move forward, it just oscillates up and down. The velocity of waves depends on the velocity of the wind. If wind velocity is higher, the waves rise high up. During storms, waves can rise to a considerable height. Such waves can prove to be devastating.

Wind is the main reason of wave generation. However, wave can also be generated due to earthquakes and volcanic eruptions on the ocean floor. The height of such waves increases as they approach the coast. These waves are called tsunami waves.

These are highly destructive and may lead to large scale loss of property and life. The earthquake that occurred near Sumatra Island in 2004 had generated huge tsunami waves, devastating the coastal region of India and Sri Lanka.

2) **Tides :** The rise or fall in the ocean water level at specific times is called tide.

Type of tides : The following are the two main types of tides.

a) Spring tide

b) Neap tide.

a) Spring tide : The forces of the moon and the sun generating tides operate in one and the same direction on the new moon and the full moon days. This tide is called spring tide.

b) Neap tide : While revolving around the earth, the moon is at right angle to the earth with respect to the sun twice in a month. This situation is observed on quarter moon days. The region where the sun causes high tide, the moon creates a low tide conditions. As against this, the region where the moon causes high tide, the sun creates low tide conditions. Therefore, during the high tide generated on these days, the water level has lower rise and the lowtides also have lesser fall to a lesser extent. This type of tide is called neap tide.

Importance of tides :

During high tide, along with the sea water, large quantities of fish rush towards the estuaries which benefits the fishing activity there and it enables the larger vessels to reach and move out of the ports. The sewage from urban centres, contaminated water from industries, etc. are released into the sea in the coastal areas. The to and fro movement of tide water helps to flush out this contaminated

water from the coast. Attempts are now being made to generate electricity using the phenomenon of tides.

3) Ocean currents : The horizontal movement of the ocean water over a long distance in a particular direction is called ocean current. Ocean currents are permanent features. Direction, speed and continuity are the characteristics of ocean currents.

Types of Ocean currents :

a) Warm Ocean currents : The currents that move hot water towards cold regions are called warm currents. Generally they originate in the equatorial region and move towards the polar region.

b) Cold Ocean currents : The cold currents move cold water towards regions of hot climate. Generally they originate in the polar areas and move towards the equatorial region.

Effects of ocean currents on human life :

1) Ocean currents and climate : The coast along which a warm current flows generally receives more rain. As against this, the coast along which a cold current flows receives less rain. Thick fog is developed in the regions where warm and cold currents converge. Such thick fog hinders transportation.

2) Ocean currents and fisheries : Marine plants, algae, plankton, etc. thrive well in the areas where warm and cold currents meet. These are food for the fishes. As a result, fish from the surrounding areas come there on a large scale. They breed there. Hence, large scale fishing grounds develop in such areas.

3) Ocean currents and transportation : As far as possible, the vessels follow ocean currents. This increases their speed and saves time and fuel. Thus, the cost of transportation is reduced.

Points to remember :

- Ocean waters are dynamic in nature.
- Due to the impact of wind energy, the sea water gains momentum and ripples develop on its surface which results into sea – waves.
- The velocity of waves depends on the velocity of the wind.
- Wind is the main reason of wave generation.
- There are two types of tides: Spring tide and Neap tide
- The horizontal movement of the ocean water over a long distance in a particular direction is called ocean current.
- The currents that move hot water towards cold regions are called warm currents.
- The cold currents move cold water towards regions of hot climate.

Keywords :

Temperature	Density
Salinity	Gravitational
Volcanic eruption	Sea waves
Earthquake	Velocity
Tsunami	Tides
Spring Tide	Neap tide
Ocean currents	

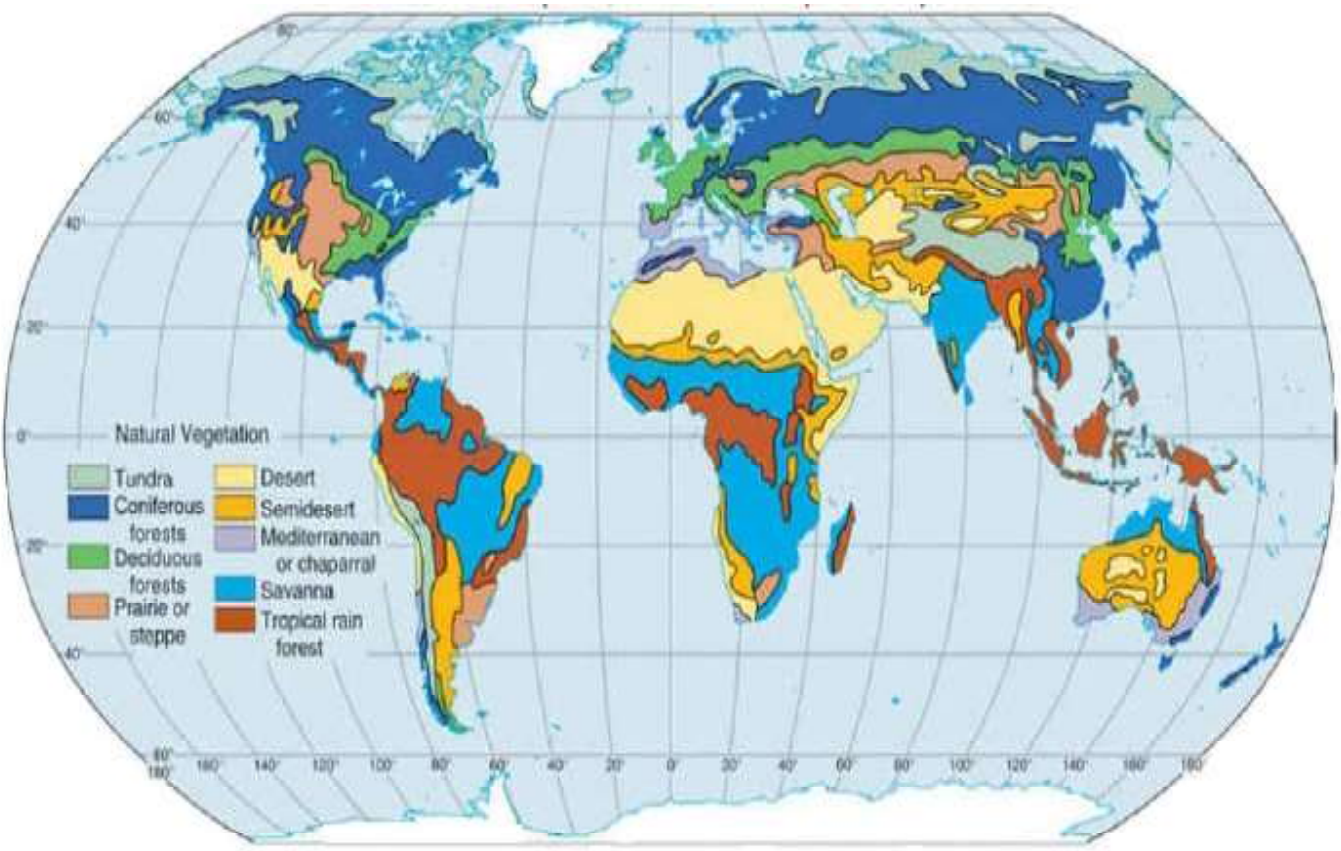
Lesson - 9

Natural Regions

There is a lot of diversity in the climate, soil and vegetation found in different regions of the earth. At the same time, the same type of climate, and plant and animal life is observed across the various continents in the regions of specific latitudes. Regions having a similar natural environment are called as natural regions.

Climate, soil, plants, animals are all factors of natural environment. Man makes use of all of them as natural resources. This leads to certain characteristic features of human life in different natural region.

All the land in the world is divided into thirteen natural regions on the basis of factors such as the regional climate, soil and vegetation. Look at the map and find different natural regions shown on the map.



Natural regions and their vivid characteristics :

Natural regions in the Torrid Zone

1) **Equatorial regions :** Rainfall all the year round high temperature, little variation in the annual temperature and dense evergreen forests.
2) **Grasslands in the Torrid Zone :** Rainfall during a particular period, tall and thick grass, scattered trees.
3) **Monsoon regions :** Winds change direction according to the seasons, rainfall in a particular season, types of forest varies according to the amount of rainfall.
4) **Hot desert region :** Extreme (hot) heat and scanty rainfall. Thorny plants with minimum leaves.

Natural Regions in the temperate zone :

1) **Mediterranean region :** Dry summers and wet winters broad leaved plants.
2) **Sub : tropical region with a humid climate :** Hot and humid summer and mild winter. This region is mainly found in the eastern parts of the continents. Broad leaved, evergreen forests and grasslands.
3) **Interior region of the continents, with a dry climate :** Long summer and cold winter, mostly cyclonic rain, mixed deciduous and coniferous forests.
4) **Temperate Grasslands :** Great variations in summer and winter temperature low rainfall during a limited period, short grass. As there are cold currents near the east coast of North America coasts freeze in winter. This part of North America is called the Saint Lawrence type region.
6) **Regions with Western :** Cyclonic rain from European type climate the western lies coniferous trees and very short grass.

5) **Interior region of the Continents, with a dry climate :** Very low rainfall being in the interior part of the continents stunted plants.

Natural regions in the Frigid Zone :

1) Taiga region : Extreme variation in the winter and summer temperature coniferous forests.

2) Tundra region : Extremely cold climate, snow-covered area, plants with a short life – span.

3) Mountainous regions : Climate changes according to the altitude. Hence various types of natural plants and animals are found only as an exception.

4) Ice-cap or ice sheet region : Temperature below freezing point throughout the year. Plants and animals are found only as an exception.

Points to remember :

- Regions having a similar natural environment are called as natural regions.
- Climate, soil, plants, animals are all factors of natural environment.
- All the land in the world is divided into 13 natural regions.
- As there are cold currents near the east coast of North America coasts freeze in winter. This part of North America is called the Saint Lawrence type region.

Keywords :

Latitude	Mediterranean
Deciduous	Saint Lawrence type region
Taiga region	Ice- cap or Ice sheet region

Lesson - 10

Interior of the Earth and Rocks

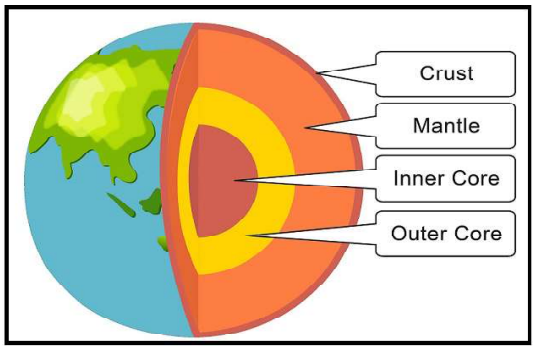
Man has obtained considerable information regarding the earth's surface, life on earth, the earth's atmosphere, etc. Man is also trying to know more about the solar system and the universe. But he has not been able to see with his own eyes what the interior of the earth looks like. We can only make a guess at what the interior of the earth is like.

Interior of the earth : There is no consensus about the origin of the earth. The earth may first have been transformed into a very hot liquid state. Over a period of time, this hot liquid probably cooled down. As a result, the outer part of the earth cooled down and became solid. This solid outer shell of the earth is called as the earth's crust. The distance measured from the surface of the earth's crust to its center is about 6360 km.

If we go deeper into a mine, we find that the temperature goes on increasing. Also the lava coming about of a volcano is very hot. From this we can infer that the internal part of the earth is hot. Innumerable earthquakes occur in different parts of the earth every year. They create seismic waves. These waves pass through the interior of the earth.

Formation of the interior of the earth : The given figure shows the earth's interior as it might appear in a section from the centre.

The earth's crust : The outermost solid cover or shell of the earth is known as the earth's crust. The thickness of this crust is about 30 km. The upper part of the crust consists of silica and aluminum in greater proportions.



That is why, it is called 'Sial.' Whereas, the lower part of the crust is called 'Sima' because the proportion of silica and magnesium is higher in this part.

Mantle : The mantle lies below the earth's crust. Its thickness is about 2900 km.

Core : The earth's core lies below the mantle. Its thickness may be about 3400 km. It is divided into two parts- the outer core and the inner core. The outer core is probably in a liquid state and the inner core in a solid state. The core mainly consists of iron with some amount of nickel and sulphur.

The study of the earth's interior helps us to understand the original rocks in the earth's crust and their later transformation.

Rocks : The solid parts of the earth's crust are called rocks. Most of the rocks are made up of two or more minerals. Minerals are obtained from the rocks. Soil is also formed from the rocks. Hence, the study of rocks is very important. Rocks are classified into three main types depending upon the process of their formation.

1) Igneous 2) Sedimentary 3) Metamorphic

1. Igneous rocks : Hot lava pours out at the time of volcanic eruptions and cools down later on, forming rocks. The molten earth materials known as magma, sometimes cools down beneath the earth's crust, again forming the rocks. Both these types of rocks are known as igneous rocks. Igneous rocks are generally hard and granular. The grains in the rocks are of different sizes and colors. The grains in the rocks appear to have been arranged in different ways. There are no layers in igneous rocks. Fossils are not found in igneous rocks. Rocks formed by the cooling of molten matter beneath the earth's surface are called as intrusive igneous rocks. Granite and gabbro's are the main examples of these rocks. Very often, rocks beneath the earth's surface melt on an account

of earth's movements. The molten matter thus formed tries to come up, but many times it cools down beneath the earth's crust as it cannot come up. This process of cooling down is slow. That is why big crystals of minerals are formed. The intrusive rocks are thus crystalline rocks.

The molten magma pours out on the earth's surface at the time of volcanic eruptions. The gases in this magma, mix with the atmosphere. The remaining liquid matter is called 'lava'. This lava cools down quickly. Hence, the process of crystallization is not completed. Rocks formed from the lava in this manner are called extrusive igneous rocks.

Sometimes, the molten matter comes up through gaping cracks in the earth's crust and spreads on the surface, forming extrusive igneous rocks. Basalt is an example of extrusive igneous rocks. A very large area of the Deccan Plateau consists of basalt rocks.

2. Sedimentary rocks : the atmosphere is constantly at work on land, on account of which the rocks break up and wear out. They get transformed into smaller pieces and soil. These substances are carried away by the rivers, wind and other agents. They get deposited in layers one above the other. Over a period of time, such layers become sedimentary rocks.

Lime, earth, clay and similar substances deposited on the surface of the earth form a cement like paste. This paste binds the pieces of rock which gives a sort of hardness to sedimentary rock. Sometimes, in the sedimentary rocks formed from this deposited material, fossils of plants and dead animals are found. Such fossil containing rocks are useful for studying life on earth.

Sedimentary rocks are of various colors. Their color depends on the minerals in the original rocks, chemical actions etc. Sandstone, limestone, shale are some examples of sedimentary rocks.

3. Metamorphic rocks : The nature of igneous and sedimentary rocks changes due to the effects of tremendous heat or pressure and different types of new rocks are formed. These new, transformed rocks are called metamorphic rocks.

The chemical composition of the original rock does not usually change in the process of transformation or metamorphosis of rocks. Metallic minerals are found in the metamorphic rocks. Some examples of metamorphic rocks formed from igneous and sedimentary rocks are given below.

Type of rock	Name of the original rock	Name of the Metamorphic rock
Igneous	Granite	Gneiss
Igneous	Basalt	hornblend, schist
Sedimentary	limestone	marble
Sedimentary	coal	graphite coal
Sedimentary	sandstone	quartzite
Sedimentary	shale	slate, Mica, schist.

Use and importance of rocks :

Rocks are useful in many ways :

1) They are useful for building houses and roads.
2) Various minerals are obtained from rocks.
3) Soil is formed from rocks. Soil is very important for agriculture.

In some places, the original form of rocks and soil changes because of pollution.

Points to remember :

- The solid outer shell of the earth is called as the earth's crust.
- The upper part of the crust consists of silica and aluminum in greater proportions. That is why, it is called 'Sial.'
- The lower part of the crust is called 'Sima' because the proportion of silica and magnesium is higher in this part.
- The mantle lies below the earth's crust.
- The earth's core lies below the mantle.
- The solid parts of the earth's crust are called rocks.
- The molten earth materials known as magma, sometimes cools down beneath the earth's crust, again forming the rocks. Both these types of rocks are known as igneous rocks.
- Smaller pieces of rocks and soil are carried away by the rivers, wind and other agents. They get deposited in layers one above the other. Such layers then become sedimentary rocks.
- The nature of igneous and sedimentary rocks changes due to the effects of tremendous heat or pressure and different types of new rocks are formed. These new, transformed rocks are called metamorphic rocks.

Keywords :

Earth's crust	Seismic waves	Metamorphic
Magnesium	Mantle	Core
Rocks	Igneous	Sedimentary
Silica	Lava	Fossil
Basalt		

Lesson - 11

Winds

The high and low pressure belts are formed on the surface of the earth. Because of such difference in the air pressure, air moves horizontally from high pressure to low pressure. This is called wind.

We can learn the direction in which the wind is blowing with the help of a weathervane or wind vane.

There are three major types of winds :

A) Planetary winds

b) Local winds

c) Seasonal winds

a) Planetary winds :

These winds blow all-round the year. They occupy an extensive area on the earth. That is why they are called as planetary winds. They are also called as types of planetary wind :

i) Easterlies

ii) Westerlies

iii) Polar winds

i) **Easterlies :** These winds blow from east to west. That is why they are called the easterlies.

ii) **Westerlies :** These winds blow from west to east. That is why they are called westerlies.

iii) **Polar winds :** Winds that blow from the polar high pressure belts to the sub-polar low pressure belts are called Polar winds.

b) Local winds :

Winds that occur due to specific conditions during particular periods and blow within a comparatively limited area called as local winds. These winds are known by various names. The main types are as follows :

i) Valley and mountain winds ii) Land and sea breeze

i) Valley and mountain winds : During the day, air on mountain tops gets heated faster. It becomes lighter and moves upwards. Compared to this, the air in the valley is not very hot. At this time, the air pressure is higher in the valley region than on the mountain top. Hence, winds start blowing from the valley to the mountain top. These winds are called valley winds.

At night, mountain tops cool down faster. In comparison, the air in the valley is warmer. At this time, the air pressure near the mountain top is greater than the air pressure in the valley region. At this time the mountain winds start blowing to valley are called mountain winds.

ii) Land and Sea breeze : During the day, the land along the coastline gets heated faster than the sea water. Therefore, the air on the land becomes hotter and the air pressure is low. The sea water gets heated slowly, and that is why the air there is less hot and the pressure of the air is high. During the day, winds blow from the sea to the land. They are called sea breeze.

At night, land cools down faster than the sea. Therefore the air pressure is higher on land. The air pressure on the sea is comparatively low. Thus, winds blow from the land to the sea at night. They are called land breeze. These winds blow generally in the coastal region.

c) Seasonal Winds :

Winds that blow in particular seasons are called seasonal winds. Winds that change their direction in summer and winter, that is, according to the season are called as seasonal or monsoon winds.

Cyclone :

Due to certain atmospheric changes, air pressure in an area drops considerably and the surrounding area has high pressure. At such a time, winds blow from the outside high pressure towards the central low pressure area in a circular direction. These are called cyclonic winds. The centre of the cyclone is shown by the letter 'L' (Low).

Anticyclone :

Sometimes, due to certain atmospheric changes, pressure in an area increases considerably and the surrounding area has low pressure. Winds start blowing from the central high pressure area to the peripheral low pressure area in a circular direction. These are called anticyclonic winds. The centre of the anticyclone is marked with the letter 'H' (High).

Effects of the Winds :

1. The inequality between the air pressures reduces due to the winds.
2. As winds carry vapor, the moisture in the air increases, which causes rain.
3. If the wind is blowing from a cold region to a hot region, the temperature of the hot region decreases. And if the wind is blowing from a hot region to a cold region, the temperature of that region increases.
4. Waves in the sea are caused by winds.
5. The direction of the ocean currents is mainly determined by the planetary winds.
6. Wind has been used for the generation of energy since ancient times. In modern times, wind energy is used on a large scale to generate electricity. Wind energy centers have been set up in different parts of the Countries.

Weathervane :

This instrument is used for finding out direction of the winds.

Points to remember :

- Due to the difference in the air pressure, air moves horizontally from high pressure to low pressure. This is called wind.
- We can learn the direction in which the wind is blowing with the help of a weathervane or wind vane.
- There are three major types of winds: Planetary winds, local winds and seasonal winds.
- Planetary winds are of three types: easterlies, westerlies and polar winds.

- Winds that occur due to specific conditions during particular periods and blow within a comparatively limited area called as local winds.
- When the winds start blowing from the valley to the mountain top. These winds are called valley winds.
- During the day, winds blow from the sea to the land. They are called sea breezes.
- Winds that change their direction in summer and winter, that is, according to the season are called as seasonal or monsoon winds.
- Winds blow from the outside high pressure towards the central low pressure area in a circular direction. These are called cyclonic winds.
- Winds start blowing from the central high pressure area to the peripheral low pressure area in a circular direction. These are called anticyclonic winds.
- The direction of the ocean currents is mainly determined by the planetary winds.

Keywords :

Weathervane	Wind vane	Planetary winds
Local winds	Easterlies	Seasonal winds
Westerlies	Polar winds	Cyclone
Anticyclone		

Lesson - 12

Air Pressure

Air has weight but we do not feel it.

Weight of the air : Because air has weight, it creates pressure. Bar is the unit for measuring air pressure. Air pressure is expressed in millibars.

Factors affecting air pressure :

1) Temperature : When the temperature rises, air expands and the density of air becomes less. As a result, air pressure reduces. As against this, as the temperature decreases, air contracts and its density increases and air pressure also increases. Mostly the temperature in the equatorial region is high; hence the air pressure over there is low, the temperature is low in the polar region and the air pressure remains high.

2) Altitude : Due to the pressure of the upper layers, the air pressure near the surface of the land is high. The height of the column of air decreases as we go high above sea level. Therefore, air pressure is less at higher altitudes.

Vertical distribution of air pressure : Air pressure varies according to the altitude. This is called the vertical distribution of air pressure.

Horizontal distribution of air pressure : The air pressure is not the same horizontally over the surface of the earth. It varies in the different regions. This distribution of air pressure is called the horizontal distribution.

Isobars : A line joining the places on the map having the same air pressure is called an isobar.

Pressure belts : Pressure belts are formed from the equator to the poles. They are as follows.

1) Equatorial low pressure belt : This belt extends from the equator upto 5^0 south latitudes. The air near the surface becomes hot and light. As a result, it rises upwards. This causes a low pressure belt near the surface in the equatorial region.

2) Mid latitudinal high pressure belt : Air which has risen from the equatorial region flows at a higher altitude towards the polar region. Due to the low temperature at that altitude, air becomes cold and heavy. This cool air descends between 25^0 and 35^0 latitudes in the northern as well as southern hemispheres. This result in the formation of high pressure belts near the surface.

3) Sub polar low pressure belt : Air in the sub polar region gets pushed upward due to a friction with the surface and the earth's rotation. As a result, a low pressure belt is formed in this area near the surface.

4) Polar high pressure belt : On both the poles, the temperature is below 0^0c throughout the year. As a result, high pressure belts are formed near the surface in the Polar Regions. They are called polar high pressure belts.

Aneroid barometer :

Air pressure is measured in millibars. Various types of barometer are used to measure air pressure.

Points to remember :

- Bar is the unit for measuring air pressure.
- Air pressure is expressed in millibars.
- Air pressure varies according to the altitude. This is called the vertical distribution of air pressure.
- The air pressure is not the same horizontally over the surface of the earth. It varies in the different regions. This distribution of air pressure is called the horizontal distribution.
- A line joining the places on the map having the same air pressure is called an isobar.

Keywords :

Millibars	Bar
High Pressure belts	Low Pressure Belts
Aneroid Barometer	Isobar

Lesson - 13

Air Temperature

The extent of heat in the air is known as air temperature. The instrument used for measuring the extent of heat is called the thermometer. Air temperature is measured in degrees Celsius (^{0}C)

Factors influencing temperature :

1) Latitude (distance from the equator) : When the rays of the sun occupy a large area, the heat gets distributed over a wide area and that is why, the temperature there is low, but when a small area gets the same amount of heat, the temperature in that area is high. The rays generally fall perpendicular in the equatorial region and occupy less area. Therefore, the temperature in that region is high. Comparatively, in regions away from the equator, the rays are slanting and hence occupy a wider area. As they occupy more area, the temperature there is low. That is why, as we move away from the equator the temperature decreases.

2) Altitude : As we go higher and higher from the sea level, the air temperature in the troposphere goes on decreasing. That is why the air temperature is higher on lower altitudes and low on higher altitudes.

3) Proximity to the sea : Land becomes hot quickly and cools down quickly. On the other hand, water takes time to become hot and cools down slowly. That is why, in coastal regions, the day temperature is high and the night temperature is low in the coastal regions. The climate around large water bodies is usually even.

4) Ocean Currents : Currents flowing from the equator to the poles are hot, whereas currents flowing from the poles to the equator are cold. If these currents are flowing along the coast they affect the temperatures of the coastal regions. If a cold current is flowing

along a coastal region the temperature in that region becomes low, and if a hot current is flowing near a coastal region the temperature of that region rises.

Distribution of temperature :

Distribution of temperature is explained in two ways.

1) Vertical distribution : The change in temperature that takes place due to altitude is called vertical distribution of temperature.

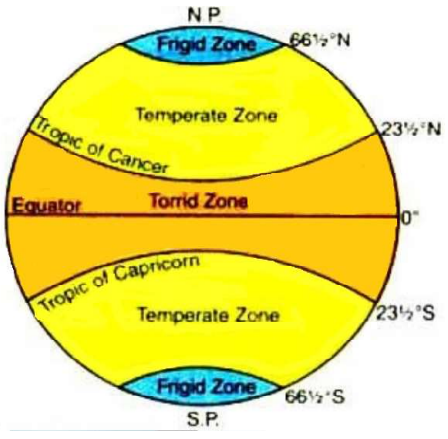
2) Horizontal distribution : The change in temperature that takes place in a horizontal direction on the surface of the earth is called horizontal distribution of temperature.

Isotherm :

A line joining the places on the map having the sam temperature is called an isotherm.

Temperature zones : Based on the difference in temperature, different temperature zones are defined from the equator to the poles. They are as follows :

1) Torrid zone : Rays of the sun fall perpendicular in the region north and south of the equator up to 20^0, 30^0 latitudes. Hence, the temperature in this region is quite high. That is why it is called the Torrid Zone.



2) Temperate Zone : Rays of the Sun slant slightly between 23^0, 30‘ and 66^0, 30‘ latitude in both the hemispheres.Hence, the temperature in the region between these latitudes is neither too hot nor too cold. That is why, it is called the temperate zone.

Simple thermometer : Different types of thermometers are used for measuring air temperatures. When the air temperature rises, the mercury in the tube expands and moves upwards in the tube. If the

air temperature decreases the mercury in the tube starts descending. With the help of this thermometer, air temperature at a particular time can be measured. It is measured in degrees Celsius.

Points to remember :

- The extent of heat in the air is known as air temperature.
- The instrument used for measuring the extent of heat is called the thermometer.
- Air temperature is measured in degrees Celsius (^{0}C)
- The change in temperature that takes place due to altitude is called vertical distribution of temperature.
- The change in temperature that takes place in a horizontal direction on the surface of the earth is called horizontal distribution of temperature.
- A line joining the places on the map having the same temperature is called an isotherm.
- Rays of the sun fall perpendicular in the region north and south of the equator which leads into high temperature in that region. That is why it is called the Torrid Zone.
- Rays of the Sun slant slightly between 23^0, 30‘ and 66^0 30‘ latitude in both the hemispheres. Hence, the temperature in such a region is neither too hot nor too cold. That is why, it is called the temperate zone.

Keywords:

Air temperature	Thermometer
Vertical distribution	Horizontal distribution
Isotherm	Mercury
Celsius	Frigid zone

Lesson - 14

Rain

We get water mainly in the form of rain. There are three types of rain depending on the manner in which it occurs.

1. Convectional rain 2. Orographic rain 3. Cyclonic rain

1. Convectional rain :

Air becomes hot due to the heat received from the sun and starts rising higher. When it goes up, the air starts becoming cool and its capacity to hold vapor reduces. Thus, the vapor in the rising air condenses and it rains. We have this type of rain in the regions where air moves vertically.

This rain caused by the upward flow of hot air is called convectional rain. This type of rain falls in the afternoon every day in the equatorial region. This type of rain is accompanied by thunder and lightning.

2. Orographic rain :

Winds coming from over the sea or large water bodies contain plenty of vapor. They are obstructed by high mountain ranges and rise upward. Due to the low temperature at the high altitude, the vapour in the air condenses and it rains. Rain caused by obstructing mountains forcing the air to rise is called orographic rain.

It rains more on the mountainside where the winds are obstructed and rise upwards. The vapour content in the winds that have crossed the mountain is less. Vapour holding capacity of these descending winds also increased and hence, rains less. Such a region of low rainfall is called a rain shadow.

3. Cyclonic rain :

When a cyclone is developing in a certain area, the air in the cyclone starts rising, its temperature decreases and the vapour in the air condenses. Thus, it rains. This rain is called cyclonic rain. When a cyclone moving from one place to another it rains in the region it

crosses. In the temperate zone this type of rain is common.

The Torrid Zone also receives the cyclonic rain to some extent. It is of a stormy nature.

The world receives mostly these three types of rain.

World distribution of rain :

1. Areas of low rainfall :

Regions that receive less than 500 mm rainfall are included in this category. It comprises cold deserts, lying to the extreme north of the continents. The continent of Antarctica, the interior part of Asia and Africa, the Kalahari Desert in South Africa and the desert region of central Australia. In a region of low rainfall, thorny vegetation is mainly found.

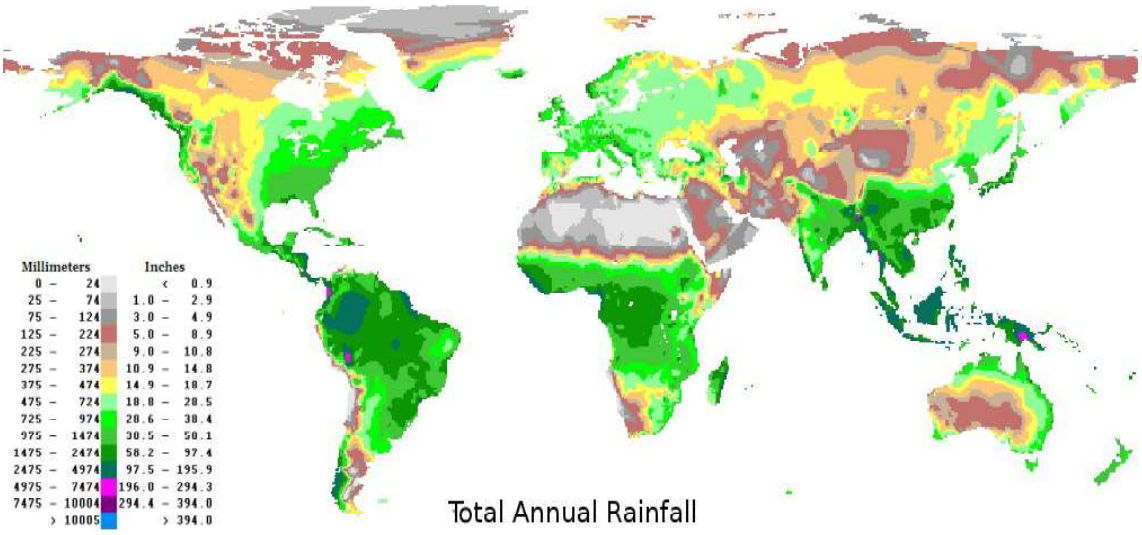
2. Area of Moderate rainfall :

Areas which receive an average annual rainfall between 500 to 1000 mm are included in this category. This comprises the eastern part of the continents of North America, Asia, Australia as well as parts of South Africa, South America and Europe. In this region, mainly grasslands are found.

3. Areas of heavy rainfall :

Regions where the average annual rainfall is more than 1000mm fall into this category. Within this belt, South East Asia, parts of the Indian sub-continent, Central Africa and the Amazon valley in South America receive more than 2000 mm of rainfall. South America, South east China, South eastern part of the United States are also areas of high rainfall. Forest is the main vegetation type here. The instrument used for measuring rain is called a rain gauge.

In an observatory, a rain gauge is placed on a platform in an open space. The amount of a rainfall during the day is measured glass at a fixed time. In regions with heavy rainfall, rain is measured every three hours.



Total Annual Rainfall

Convectional rain :

Convectional rain occurs when the Earth's surface, within a conditionally unstable or moist atmosphere, becomes heated more than its surroundings, leading to significant evaporation.

Points to remember :

- The rain caused by the upward flow of hot air is called convectional rain.
- Rain caused by obstructing mountains forcing the air to rise is called Orographic rain.
- When a cyclone is developing in a certain area, the air in the cyclone starts rising, its temperature decreases and the vapor in the air condenses. Thus, it rains. This rain is cyclonic called rain.
- In a region of low rainfall, thorny vegetation is mainly found.
- In a region of moderate rainfall, mainly grasslands are found.
- In a region of heavy rainfall, forest is the main type of vegetation.
- The instrument used for measuring rain is called a rain gauge.

Keywords :

Convectional rain	Cyclonic rain
Orographic rain	Rain gauge

Lesson - 15

Human Occupations

In order to fulfill different needs, humans are engaged in different occupations.

Agriculture : In farming, a farmer prepares the land for cultivation, sows the seed, and applies fertilizers and manures. The sprouting of the seed and the growth of the crop takes place naturally. For preparing items like papads, we need to process black gram (urad) which is a farm product. In a grocery shop, nothing is produced or processed, but items like papads are made available for sale. In this way, there are differences in the different occupations. Human occupations are classified on the basis of these differences.

Primary occupations :

These occupations are directly related with nature. The occupations in which man uses the things that are available in nature are called primary occupations. For example, fishery, agriculture, animal husbandry, mining, etc.

Given below are the features of primary occupations **:**

1. These occupations totally depend on nature.
2. A lot of manpower is required.
3. Depending on the availability of natural resources, different primary occupations are carried out in different areas.

Secondary occupations :

Through primary occupations, we get different types of things. These are used as raw material and processed to obtain new and more useful things. The things thus obtained are called finished products. Occupations that involve manufacturing of finished products from raw material are called secondary occupations. For example. Obtaining cloth from cotton or sugar from sugarcane.

The following are the characteristics of secondary occupations-

1. The items manufactured in these occupations have better utility and greater value.
2. From perishable materials, long lasting items can be obtained.
3. Machinery is used on a large scale in these occupations.
4. Mass production of items becomes possible.

Tertiary occupations :

Some occupations are supportive to the primary and secondary occupations. To manufacture sugar or jaggery, sugarcane has to be taken to the sugar factories or to the place where jaggery is manufactured. Arrangements have to be made to take this sugar or jaggery to grocery shops to make it available for sale.

As a result of this, services like transport, marketing, post offices, telephones, television and radio are used on a large scale for mass communication.All these services are supportive to primary and secondary occupations. Such supportive occupations are called tertiary occupations.

Quaternary occupations : Certain services need special skills. Such services are included in quaternary occupation e.g. doctors, lawyers, teachers, etc.

Points to remember :

- The occupations in which man uses the things that are available in nature are called primary occupations.
- Occupations that involve manufacturing of finished products from raw material are called secondary occupations.
- Services which are supportive to primary and secondary occupations. Such supportive occupations are called tertiary occupations.
- Certain services need special skills. Such services are included in quaternary occupations.

Keywords:

Agriculture	Primary occupations
Secondary occupation	Deforestation
Quaternary occupations	Tertiary occupations

Lesson - 16

The World : An Introduction

The eastern hemisphere has more land area whereas the western hemisphere has more area occupied by water. All the land parts are seen to be pieces of various sizes surrounded by oceans. All the oceans are joined to another ocean naturally.

Oceans :

An extensive continuous body of saline water is called an ocean. 71% of the earth's surface is occupied by water. Life began only in the ocean. The water cycle also begins and ends in the ocean.

The water we get in the form of rain comes from the ocean in the form of vapor. Because for the continents, the sea water on the surface of the earth is divided into four parts. They are the Indian Ocean, the Pacific Ocean, the Atlantic Ocean and Arctic Ocean.

The Pacific Ocean : This is the biggest ocean and about 33% of the earth's surface is occupied by this ocean. The continents of Asia and Australia are to the west of this ocean.

The Atlantic Ocean : This Ocean extends in the north- south direction. The continents of Europe and Africa are to its east whereas the continents of North and South America are to its west. It stretches up to the continent of Antarctica in the south. The Arctic Ocean lies to its north.

The Arctic Ocean : This Ocean is in the area surrounding the North Pole. Most of the time, giant icebergs are seen in this ocean. This is the smallest ocean. It is connected to the Pacific Ocean by the narrow Bering Strait. In winter, the water in this strait is frozen. So, for some time, the continents of Asia and North America get connected.

Continents : About 29% of earth's surface is occupied by land. An extensive and continuous portion of land is called a continent. There are seven continents as follows:

Asia : Asia is the biggest of all the continents. This continent extends in all the four hemispheres. The continent of Asia is connected to two continents, Europe and Africa. Europe and Asia are continuous continents. Because of this continuity, these continents are also referred to as Eurasia. The continents of Asia and Africa are joined by a narrow strip of land called the Sinai Peninsula.

Europe : The continent of Europe is to the west of Asia. The Mediterranean Sea lies between the continents of Europe and

Africa. The Atlantic Ocean is to the west of Europe whereas the Arctic Ocean is to the north. This continent extends in both the western and the eastern hemispheres. The whole of this continent lies in the Northern hemisphere.

Africa : This continent stretches in all the four hemispheres. The shape of this continent is triangular.

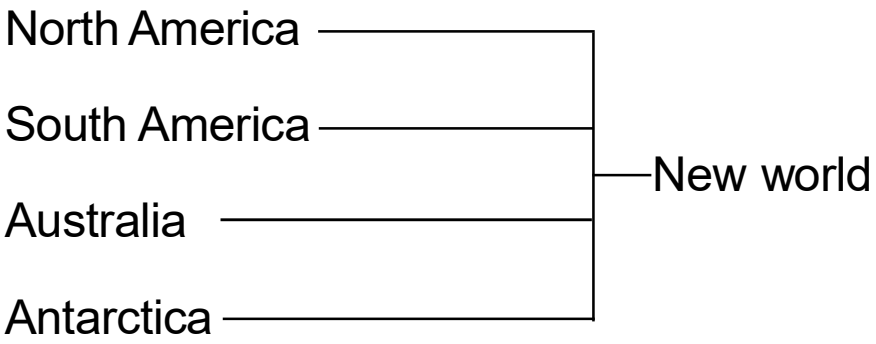
North America and South America : These continents are joined by the narrow region of Central America. The Pacific Ocean lies to the west of North and South America.

Australia : It is surrounded by oceans on all the sides. Of the seven continents, Australia is the smallest.

Antarctica : The continent has been discovered quite recently. This continent is an extensive land mass at the South Pole. It is covered with ice throughout the year. There is no human habitation on this continent. But a few countries including India have their research stations there. The shape of the continent of Antarctica is more or less round. This continent too is surrounded by oceans on all the sides.

There have been human habitations since ancient times in the three continents of Asia, Europe and Africa. Many ancient civilizations originated here. Trade, movement of travelers has been going on since ancient times between these three continents. That is why, these three continents together are referred to as the old world (known World). In comparison, the other four continents have been discovered quite recently, after the 14^{th} century.

Hence, these four continents are referred to as the new world.



Points to remember :

- An extensive continuous body of saline water is called an ocean.
- Pacific Ocean is the biggest ocean and about 33% of the earth's surface is occupied by this ocean.
- An extensive and continuous portion of land is called a continent.
- Asia is the biggest of all the continents.
- The continents of Asia and Africa are joined by a narrow strip of land called the Sinai Peninsula.
- Of the seven continents, Australia is the smallest.

Keywords :

Eastern hemisphere	Western hemisphere
Europe	Pacific Ocean
Indian Ocean	Atlantic Ocean
Africa	Arctic Ocean
Sinai Peninsula	Continents

Lesson - 17

Asia - Physical

The continent of Asia is the biggest continent in the world. Out of the total land area of the earth, about 33% is occupied by this continent. Mount Everest, the highest peak in the world, is in this continent and the lowest point on land also lies in this continent.

Extent and boundaries :

The Arctic Ocean in the north, the Pacific Ocean in the east and the Indian Ocean to the south define the boundaries of this continent. The western boundary is completely on the land and mainly passes through the Ural Mountains.

Physical features :

Mountains : Many mountain ranges starting from the Pamir plateau in Central Asia spread in different directions. The Himalaya and Karakoran range spread towards the south-east from the Pamirs. Tien Shan Mountain is to the north- east of Pamir. The Hindu Kush and Sulaiman ranges spreading to the west of the Pamirs stretch up to Turkey and are known by different names there.

Plateaus : There are vast plateaus between different mountain ranges. The Tibet plateau lies between the Himalayas and Kunlun. As this plateau is the highest in the world; it is called the 'Roof of the World'. Besides this, the Deccan Plateau in China, the Central Siberian Plateau in Russia and the Arabian Plateau to the west are some of the main plateau.

Deserts : Vast deserts found in different parts of the continent is also a special feature of Asia. Rub-al- Khali in the Arabian plateau, Thar (Great Indian Desert) in the Indian subcontinent occupy a large part of the continent.

Peninsula : There are many peninsulas towards the south in this continent. The important peninsulas are those of Saudi Arabia, India, and Malaysia etc. the Kamchatka peninsula is in the north-east of the continent.

Islands : Japan, Indonesia, Philippines, Sri Lanka, Maldives, Andaman-Nicobar etc. are the islands in the continent of Asia. The central part of most of these islands is mountainous and there are plains to some extent in their coastal regions.

Rivers : There are many rivers flowing in different directions from the central mountainous region.

They are classified as follows 0 :

Rivers meeting the Arctic Ocean : The Rivers Ob, Yenisei and Lena in the north of the continent are included in this group. In winter, the water near their mouths freezes and obstructs their flow. Hence, a marshy area is formed in their valleys.

Rivers meeting the Pacific Ocean : Among these, Huang He, Yangtze and Mekong are the main rivers. The word 'Huang He' means yellow in Chinese. This river brings the yellow coloured loess soil with it on a large scale that is why it is called Huang He.

Rivers meeting the Indian Ocean : In the Indian subcontinent, Indus, Narmada, Tapi are the rivers that meet the Arabian Sea whereas the Ganga, Brahmaputra, Godavari, Krishna and the Irrawaddy in Myanmar meet the Bay of Bengal. The rivers Tigris and Euphrates from Irrawaddy meet the Persian Gulf. The Red sea, the Persian Gulf, the Arabian Sea and the Bay of Bengal are all parts of the Indian Ocean.

Rivers in the interior of the continent : Besides the rivers meeting the various oceans, there are rivers in the continent that meet the land locked sea or disappear. They do not meet any ocean. They include the Styr Darya and Amu Darya rivers that meet the Aral Sea and Helmand that disappears on the plateau of Iran.

Climate : Its expanse in the torrid, temperate and frigid zones, proximity to the oceans, vast continents, the central mountain ranges have all influenced the climate of Asia. Hence, there is a lot of diversity in the climate of this continent.

As the interior of the continent is far away from the sea, summers are very hot and winters are very cold there. The temperature and frigid zones, proximity to the oceans, vast continents, and the central mountain ranges have all influenced the climate of Asia.

Hence, there is a lot of diversity in the climate of this continent. As the interior of the continent is far away from the sea, summers are very hot and winters are very cold there. The temperature in January at Verkhoyansk, where the minimum temperature in the world is recorded as low as -50^{0}C, on the other hand, Jacobabad in Pakistan records the maximum temperature 55^0 C in the world.

The distribution of rainfall is also very uneven. The highest rainfall in the world is at Mausinram in India and at Cherrapunji in India.

Points to remember :

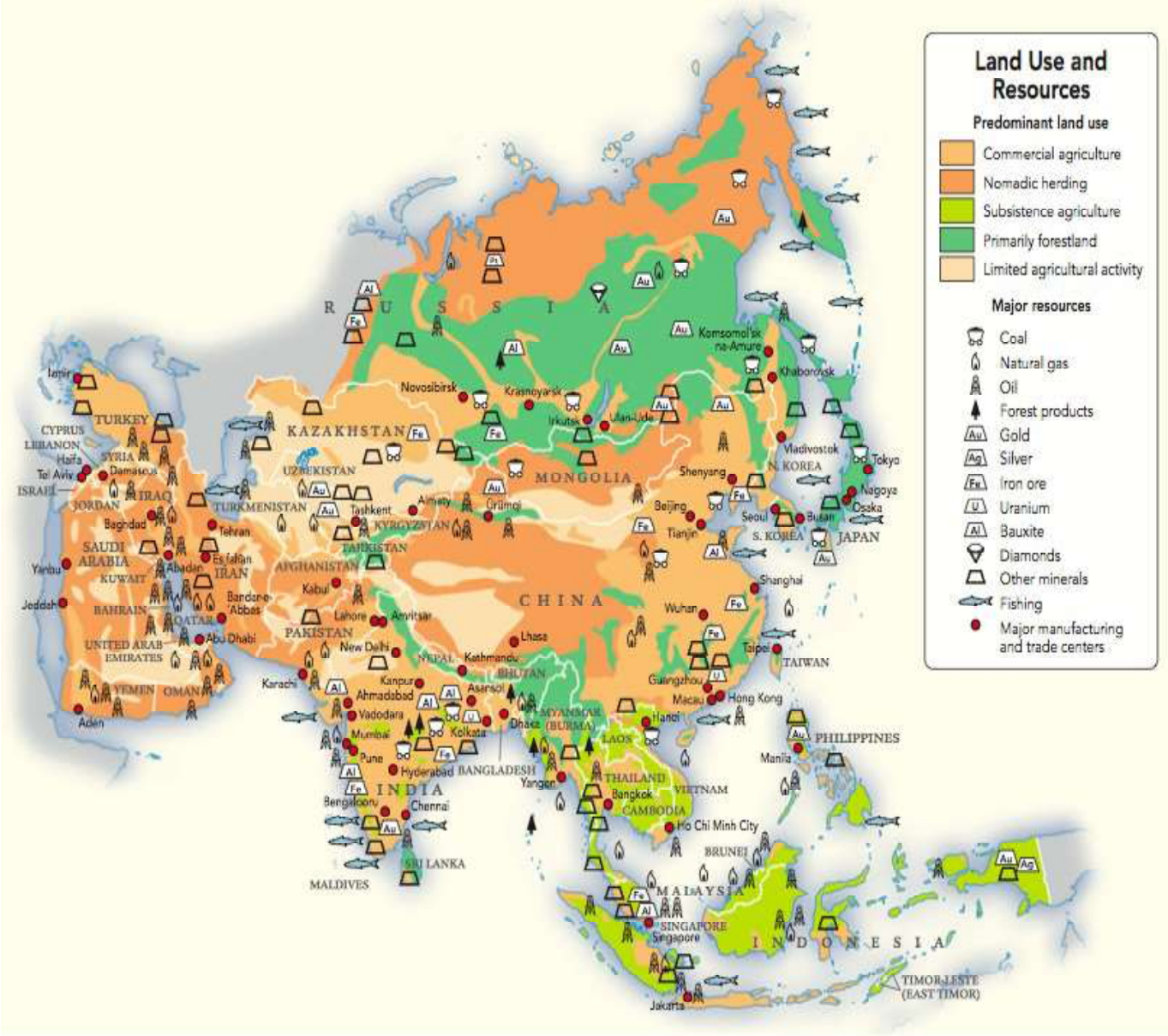
- Mount Everest, the highest peak in the world.
- The Tibet plateau lies between the Himalayas and Kunlun. As this plateau is the highest in the world; it is called the 'Roof of the World'.
- Rub-al- Khali in the Arabian plateau, Thar (Great Indian Desert) in the Indian subcontinent occupy a large part of the Asian continent.
- The important peninsulas in Asia are those of Saudi Arabia, India and Malaysia.

Keywords :

Mount Everest	Himalaya	Karakoran
Thar desert	Peninsula	Island
Plateau	Huang He	

Lesson - 18

Asia - Natural Resources



All the things that man uses to satisfy his daily needs as well as to enrich his life are called resources. Resources that are available in nature are called natural resources. By processing the natural resources, man makes new things which are included in manmade resources.

Natural resources :

Mineral resources : The industrial development of a nation is largely dependent on its mineral resources.Mineral oil, natural gas and coal are the energy sources available to a great extent in Asia.

There are coal deposits in the northern, southern and eastern parts of Asia. Natural gas and mineral oil are mainly found in the south-west. There are uranium deposits in India, China and Kyrgyzstan. Besides these, other minerals found in different parts of Asia are bauxite, copper, zinc, tungsten, mica and manganese. Iron ore is found in almost all the parts of Asia. Good quality iron ore deposits are found in India, Russia, China and Indonesia.

Mineral resources do not regenerate in a short time. That is why, it is extremely essential to use minerals economically, to re-use them whenever possible or to find an alternative to them.

Soil resource : Soil resource is the main support of living organisms on the earth, because the plants on whom all living things depend directly or indirectly for food, depend mainly on the soil in which they grow. There is fertile alluvial soil in the valleys of the Indus, Ganga, Brahmaputra, and Huang He, Yangtze, Tigris and Euphrates rivers. Agriculture has therefore developed well in these regions. Black soil is found on a large scale in the plateau region of the Indian peninsula. Less soil is found in the extensive regions of China. Sandy or sand mixed soil is found to a large extent in the desert regions.

Water resource : Water is an essential resource for the life of all living organisms. We use water for domestic purposes as well as for agriculture, industries, generation of electricity and for many other purposes. That is why we say that water is wealth.

Water is plenty in some parts of the South, East and South–East Asia which has the monsoon type of climate and also in the equatorial region. As rainfall is scanty in the south-west, west and central Asia, there are many arid regions. Some countries in South–West Asia have started projects to desalinate sea water for obtaining potable water.

Natural resources :

Plants and animals : Forests help to maintain the environmental balance; that is why, forests are included in the natural resources.

Human resources : Citizens of any country are the most important resources of that country.

Rise in the population of Asia :

Today, the population of the world is 600 crores (6 billion) and it is estimated that it will reach 800 crores (8 billion) by 2020.
Population growth mainly depends on the ratio between births and deaths. In modern times, due to the progress made in medical sciences the death rate has gone down, but the birth rate has not reduced to that extent. That is why there is a huge growth in population.

Density of population : Density of population indicates the number of people living in an area. It is calculated by taking into consideration the number of inhabitants and the total area of the region.
Density of Population of the region =
Population (Per sq.km) / Total area of the region (sq. km)

Distribution of population in Asia :

Distribution of population depends on many factors such as the climate, productivity of the soil, natural resources etc. There is a growth in the urban population because of migration. Even though there is a growth in population, the available resources do not grow in comparison. In fact, there is a stress on the resources. Because of less resources and more users, each one gets a very small share of the resources. This has an effect on the standard of living and the health of the people. Hence, it is very necessary to control the growth of population.

Points to remember :

- All the things that man uses to satisfy his daily needs as well as to enrich his life are called resources.
- Mineral oil, natural gas and coal are the energy sources available to a great extent in Asia.
- Fertile alluvial soil are found in the valleys of the Indus, Ganga, Brahmaputra, Huang He, Yangtze, Tigris and Euphrates rivers.
- Forests help to maintain the environmental balance and therefore they are included in the natural resources.
- Population growth mainly depends on the ratio between births and deaths.

Keywords:

Natural resources	Mineral resources
Uranium deposits	Sandy or sand mixed soil
Alluvial soil	Soil resource
Desalinate	Human resource
Inhabitants	Population

Lesson - 19

India - An Introduction

India is a Democratic Republic. It comprises of 29 constituent states and 7 Union territories. Delhi is the capital of India.

The southern part of India is surrounded by the sea on three sides. This region is known as the Indian peninsula.

India's total area is 32, 87,263 sq. km. Area wise, it ranks seventh in the world. Its land border measures 15,200 km and its coastline is 7,517km. India is one of the important countries in the Asian continent. According to the census taken in 2001, the total population of India was 102 crores and 70 lakhs. India ranks second in the world in terms of population.

Physical divisions of India :

The physical divisions of India are as follows :

1) The northern mountainous region
2) The Indian islands
3) The north Indian plains
4) The Indian plateau
5) The coastal lowlands

Climate : The vast latitudinal expanse of India, the Himalayas in the north and the vast oceanic region to the south affect the climatic conditions in India.

Summer : The summer season lasts from mid-February to mid-June. During this period, the weather is hot and dry.

Monsoon : The monsoon period lasts from mid-June to mid-September. The climate is warm and humid, at this time.

Winter : The winter season lasts from November to January in India. The climate is cold and dry.

Natural resources :

Water Resources : In India, water resources are utilized mainly through rivers, lakes, natural and artificial tanks, wells and bore wells. The rivers in the northern plains have water all the year round. Dams are constructed and the river waters are sent to distant areas through canals for irrigation and other uses. Some important examples of this are the Hirakud of the Mahanadi, the Jayakwadi on the Godavari, the dam on the Damodar, the Bhakra Nangal on the Sutlej River and the Rajasthan canal. Besides irrigation, water is used for producing hydro power, for fishing and tourism too.

Forest Wealth : The natural growth of plants, shrubs, scrub, trees, creepers, and grass in a region is known as forests. Forests help in maintaining the balance of the environment. Almost 20% of the land in India is covered with forest. The growth of natural vegetation depends on sunlight and water. The land forms, soil, and climate affect vegetation. The type of forest region changes according to

the climate. The different types of forest regions in India are as follows :

1) Evergreen forests
2) Deciduous forests
3) Thorny scrub forests
4) Forests in the coastal regions
5) Himalayan forests

1. Evergreen forests : These forests are found in regions that receive an average of more than 2000mm of rainfall and plenty of sunlight. These forests are very thick. The woods of these trees are solid, heavy and durable. Trees found in this region are mahogany, rubber, sissoo and thick creepers. We get natural rubber and wood for making furniture and building ships from these forests.

2. Deciduous forests : They are seen in areas receiving 1000 to 2000mm of rainfall. The types of trees found here are banyan, pipal, teak and bamboo. The wood and timber obtained is used for making paper, building ships and construction work.

3. Thorny scrub forests : These forests are found in the regions receiving less than 500mm of rainfall and having dry, long summers. They have thorns on their leaves and branches. Some have thick stems and store water. Their roots go deep down in search of water. Khair, babul, Khezdi, Aloe, Agave and different types of cactus are found here. These plants are useful as fuel. Herbal medicines are prepared from some plants.

4. Forests in the coastal regions : These forests are found in the marshy areas on the coastlines and creeks where the climate is humid and soil is saline. The vegetation here is known as ‘mangroves’. Wood of the mangrove plants is oily, light and durable. The roots of these plants grow out of the soil. The plant breathes through them. The wood from these forests is used for fuel and building boats.

5. Forests in the Himalayas : The forests in the Himalayas vary as per the height of the ranges, hence, the type of vegetation also varies.

A. On the snow – clad peaks many flowering plants grow when the snow melts.

B. At a lower height than these peaks, trees like pine, deodar and fir are found in the coniferous forests.

C. At the foothills of the lower Himalayan ranges, we find mixed forest. Coniferous and deciduous forests are found in plenty.

Wild life : The forests in India are abound with wildlife. They are our animal wealth. We find the musk deer, snow leopard, bear, red panda, and the mountain eagle in the Himalayas. The wild donkey (ass), wolves, the Indian fox are found in the dry, thorny scrub forest regions. The shekru (giant squirrel) is an important inhabitant of the forests in the Sahyadri region. We find the Asian lion in the Gir forests of Gujarat. The bison is a native of the deciduous forest regions in Maharashtra. The one horned rhino is found in Assam. The Indian striped tiger is mostly found in the Sunder bans and deciduous forests. The animal species that are endangered needs to be protected with special efforts. Project Tiger is an example of such efforts.

Mineral Wealth and energy Resources : In India, mineral wealth and energy resources are in plenty.

Mineral Wealth : Minerals are of two types

a) Metallic minerals b) Nonmetallic minerals

A) Metallic minerals : The minerals from which metals are obtained are known as metallic minerals. They are :

1. **Iron-ore :** India has mines of excellent quality iron ore. Iron and steel are produced from iron ore. Iron ore is found in Orissa, Jharkhand, Chhattisgarh, West Bengal, Maharashtra, Kerala, Karnataka, Andhra Pradesh and Tamil Nadu.
2. **Copper :** This metal is used for making utensils, coins, sheets

and jewellery. Copper is a very good conductor of electricity. Copper deposits are found in Jharkhand, Rajasthan, Gujarat, Andhra Pradesh and Uttaranchal.

3. **Manganese :** Manganese is used mainly to produce steel. There are many deposits of good quality manganese in our country in Karnataka, Orissa, Madhya Pradesh, Maharashtra and Goa.
4. **Bauxite :** Aluminum is produced from bauxite. This metal is very light and flexible and it does not rust. It is used for making utensils, vehicles, aeroplanes, ships and electrical equipments. These mines are located in Orissa, Andhra Pradesh Chhattisgarh, Gujarat, Maharashtra, Jharkhand, Tamil Nadu and Madhya Pradesh.
5. **Gold :** Gold is an expensive metal. In India, it is mostly used for making jewellery. Its deposits in our country are few. It is mined in Karnataka and Andhra Pradesh.

Non-metallic ores : The ores that are not used for obtaining metals are known as non-metallic ores. They are :

1. **Mica :** India ranks first in the world in producing mica.Indian mica is of a good quality. It is used in making electrical gadgets, drugs and paints. Andhra Pradesh, Jharkhand, Bihar and Rajasthan have mica mines.
2. **Gypsum :** Gypsum is used in preparing cement and chemical fertilizers. It is mined in plenty in Rajasthan, Jammu and Kashmir and in Tamil Nadu.
3. **Limestone :** Limestone is used in construction work for preparing cement and purifying iron ore. Madhya Pradesh, Maharashtra, Tamil Nadu, Orissa and Karnataka have limestone deposits.

Energy resources : The resources from which energy is generated are known as energy resources. The two types of energy resources are conventional and non-conventional resources.

1. **Conventional energy resources :** Energy resources used by man since ancient times are known as conventional energy resources e.g. wood, coal, mineral oil and natural gas.

2. **Non-conventional energy resources :** Now-a-days, attempts are made to obtain energy from the Sun's heat as well as from the wind, tides, biogas, organic waste etc. All these are non-conventional energy resources.

Below given is a map displaying India's Natural resources.

Points to remember :

- India comprises of 29 constituent states and 7 Union territories.
- The southern part of India is surrounded by the sea on three sides. This region is known as the Indian peninsula.

- The natural growth of plants, shrubs, scrub, trees, creepers, and grass in a region is known as forests.
- Evergreen forests are found in the regions that receive an average of more than 2000mm of rainfall and plenty of sunlight.
- Thorny scrub forests are found in regions receiving less than 500mm of rainfall and having dry, long summers.
- The vegetation that exists in the forests in the coastal regions are known as mangroves.
- Minerals are of 2 types metallic minerals and non-metallic minerals.
- Copper is a very good conductor of electricity.
- The resources from which energy is generated are known as energy resources.
- Energy resources used by man since ancient times are known as conventional energy.
- Attempts are made to obtain energy from the Sun's heat as well as from the wind, tides, biogas, organic waste etc. All these are non-conventional energy resources.

Keywords:

Democratic Republic	Delhi	Constituent states
Capital	Humid	7 Union Territories
Coastline Indian	Mica	Indian peninsula
Coastline	Sutlej River	Metallic minerals
Rajasthan canal	Gypsum	Non-metallic minerals
Gir forests	Mangroves	Forest wealth
LimestoneSunder bans		

Lesson - 20

The Continent of Africa

Africa stands second in the world with respect to area. 'The Sahara', is the largest hot desert and the Nile, is the longest river in the world are situated in this continent. One of the ancient civilizations of the world – 'The Egyptian civilization', has flourished in this continent.

Location extent and boundaries : The continent extends in all the four hemispheres – the North, South, and East & West. The

Mediterranean Sea separates this continent from the continent of Europe whereas the Sinai Peninsula links the continents of Africa and Asia.

Physiography : The Atlas Mountains are located in the north western part of this continent. The Ethiopian plateau is towards the east of the continent. Between the Atlas Mountain and Ethiopian Plateau is a vast hot desert. This desert is called as Sahara desert. Kilimanjaro is the highest peak in Africa. Though the peak is located at the equator, due to its height, it is always covered with ice. The continent has a very long coast. However, it is not indented and therefore it has few natural harbors.

The climate : In general, the climate of the continent is hot. In the mountainous and plateau regions, the climate is cool due to the elevation. The peaks with extreme heights experience fogs and snowfall at all times. The climate of the coastal regions of the Sahara and Namib deserts is somewhat mild.

Natural resources :

Water resources : The Nile is the longest river in the world. In the source region it is called the 'White Nile'. The Nile provides perennial water to the northern desert region. Therefore, it has proved to be a boon for this region. Thus, a large part of the continent is supplied with water by the rivers Zaire, Zambezi, Limpopo, Niger etc.

Soils : Due to the dry and hot climate of the desert, the soils in this area are sandy. Along the margins of the desert, one finds soils with brownish colour. This comes under the semi-arid regions. There are pastures in this area. In Central Africa, black soil is found in the Niger and the Zaire basins. As the percentage of humus is high, in these coils, they have become fertile. Cotton, sugarcane etc. are cultivated

Mineral resources : A variety of minerals are found in large quantities in the African continent. About 75% of the gold in the world is found in this continent. In the southern part of the continent at Witwatersrand, there are large gold mines. The continent ranks first in extracting diamonds from mines. Diamond mines are located at Kimberly. Copper from Congo, manganese from Ghana and Cobalt from Zambia are obtained on a large scale.

WITWATERSRAND

Environmental issues in the African continent :

Deforestation : The large scale felling of trees and the resulting decrease in forest areas is the main environmental problem of the continent. In order to overcome this problem, movements like plant trees and grow trees are launched on a large scale. Efforts are being made to boost afforestation.

Soil degradation : The erosion caused by rains, rivers and wind as well as the over utilization of soils for agriculture and low use of manures have resulted in turning the soils infertile.

Desertification: - Sand particles get deposited in the fertile lands on the margins of deserts due to winds. This is called desertification.

Rampant hunting: - Earlier, this region was considered to be a paradise for hunters. Lions, Cheetahs, Elephants, Rhinos and other wild animals and birds were hunted on a large scale. In order to take measures against this, national parks and sanctuaries have been developed by different countries of the continent. Due to the development of sanctuaries, the wild life and the diverse vegetation here have become a prime attraction for tourists.

Air Pollution: - In the industrial areas and urban centers, air pollution is present. The carbon monoxide emitted from vehicles as well as the smoke released from factories are adding to the air pollution.

Points to remember :

- Africa stands second in the world with respect to area.
- The Atlas Mountains are located in the north western part of this continent.
- Kilimanjaro is the highest peak in Africa.
- Sand particles get deposited in the fertile lands on the margins of deserts due to winds. This is called desertification.

Keywords :

Egyptian civilization	Sinai Peninsula
Ethiopian Plateau	White Nile
Sahara and Namib deserts	

Lesson - 21

The Continent of North America

The continent of North America ranks third in the world in terms of its area.

Location extent and boundaries : This continent is located in the northern and western hemispheres. The Pacific Ocean lies to the west, the Arctic Ocean to the north and the Atlantic Ocean lies to the east of this continent.

Physiography : The Alaska ranges are in the north. The McKinley peak, with the height of 6194 m, is the highest peak in this continent.The Rocky mountain ranges run parallel to the western coast of this continent. Colorado Plateau is a part of the Rocky mountainous region. The canyon carved out by the river Colorado is known for its scenic beauty. It is called Grand Canyon. There is a narrow portion of land to the south of Mexican deserts. This narrow land is in the form of an isthmus joining the North and South American continents. It is called Central America. The Panama Canal is situated in the southern part of this isthmus.

Climate : In the north, (mainly in Canada and Alaska) January temperature is as low as -28^{0}C, whereas in July it is 16^{0}C. In Arizona deserts, located in the southwestern part of the continent, high temperatures and very low rainfall conditions prevail. In California along the western coast, the temperatures are relatively lower than those of the eastern coast because of the cold ocean current.

Natural resources :

Water resources : The Niagara falls on river St. Lawrence Hoing the Lake Huron and lake Ontario are a prime tourist attraction.

Rivers flow in all the four directions in this continent. River Mackenzie flow towards the north, Colorado and Columbia flow towards the west, the Mississippi is an important river and it flow towards the south. The available water resources have been used mainly for the purpose of electricity generation, industries and agriculture.

Natural Vegetation : Coniferous forests are found in the region from South Alaska to Labrador. They include trees like spruce, fir, pine, larch etc. These are soft wood trees and are useful for furniture as well as manufacturing of paper. In the western mountainous region, broad – leaf evergreen trees are found. Trees like Douglas, fir, red cedar, hemlock etc. are useful as timber. The Great Plains are known as grasslands. These are called prairies. Animal husbandry and agriculture are the main occupations of this area.

Animal resources : The prairie grasslands are known for animals like bisons. Animal husbandry, particularly pig rearing, is predominant in this region. Alligators are found in the rivers of Mexico. Salmon fishes are found on a large scale in the British Columbia and Alaska. To its south, in the coniferous forests Fur coated animals like mink, beaver, silver fox etc. are found. Fishing is carried on a large scale due to the extensive coastal areas.

Soils : The alluvium brought by Mississippi and Missouri forms the soils in the Great Plains. Hence, it has become a fertile region. These soils are suitable for wheat.Therefore, this region has become a storehouse of wheat on a global scale. Agriculture in this area has flourished due to this river side location. Large scale mechanized farming is a characteristic of this region.

Mineral resources :

This continent is rich so far as mineral wealth is concerned. Silver is found in Alabama and Mexico. South California and Mississippi basin are known for mineral oil fields. Copper mines are located near the desert region of Arizona.

Points to remember :

- The continent of North America ranks third in the world in terms of its area.
- Colorado Plateau is a part of the Rocky mountainous region.
- The canyon carved out by the river Colorado is known for its scenic beauty. It is called Grand Canyon.
- The Panama Canal is situated in the southern part of this isthmus.
- The Great Plains are known as grasslands.These are called prairies.
- Animal husbandry and agriculture are the main occupations of this area.
- South California and Mississippi basin are known for mineral oil fields.

Keywords :

Alaska range	McKinley peak	Isthmus
Rocky mountain	Colorado Plateau	Grand canyon
Central America	Panama Canal	Arizona deserts
Niagara falls	River St. Lawrence	River Mackenzie
Mississippi	Prairie grasslands	

Lesson - 22

Europe - An Introduction

Europe is an industrially advanced continent of the world. It is known as the birthplace of the Western Civilization.

The total area of this continent is 1 crore 5 lakh sq. km. Europe occupies 7.7% of the total area of the world.

Physical features : The continent of Europe is a huge peninsula. Various land forms such as mountains, plateaus, valleys, plains are observed in the southern part.

Glittertinden (2470 meters) in Norway is the highest peak in this

region. The mountainous region of Alps is found in the region of Slovinia. Mount Blanc is the highest peak (4810 metres) in the Alps. Mount Elbrus (5633 metres) in the Caucasus mountains is the highest peak in Europe. The continent of Europe has an approximately 6100 km long coastline. From the early days, European countries are leading in water transport and fisheries because of the indented coastline and natural harbours. The Volga is the longest river in Europe.

Climate : Europe extends in the temperate and cold zones and is surrounded by water. That is why the temperature is low. The winter in northern and eastern Europe is long and very cold. During winter, it snows everywhere in Europe.

Natural resources : In northern Europe, forests cover extensive stretches of land. Twenty five percent of the total area of Europe is under forest. Coniferous trees are found in the regions of the Taiga type of climate. The wood of these trees is used for construction and in manufacturing paper. There are broad-leafed deciduous forests in central and southern Europe. The Steppes grasslands are in the south eastern region.

Wild life : Hairy animals are observed in the Tundra region in Europe. These include the polar bear, elk, reindeer etc. There are national parks, zoos and sanctuaries for conservation of wild life.

Occupations : About one third of the land in Europe is under cultivation. The soil in this continent is very fertile. Agriculture as an occupation and as a science has advanced greatly in Europe. The major crop is wheat. Growing fruits is also an important part of the agriculture in Europe. Fruits like apples, figs, olives, grapes are produced on a very large scale here.

Animal husbandry : Animal husbandry is an important occupation in Europe. Many farmers are engaged in this occupation. There

are extensive pastures in Europe. Breeding of excellent quality hybrid cattle and sheep first began in Europe. Jersey, Hereford cows and Hampshire, Suffolk sheep are a few of these hybrid animals.

Fisheries : A major item in European diet is fish. Fish are plentiful around the Atlantic coast and in the Baltic Sea, Black Sea, Caspian Sea and the Mediterranean Sea. Dogger Bank and Great Fisher bank, which are among the leading fish breeding centers of the world, are located in Europe. Norway is a major exporter of fish.

Mineral Wealth : Europe has a big share in production of minerals such as coal, iron ore, bauxite, natural gas etc.

Energy resources : The main energy resources in this continent are coal, natural gas and mineral oil. Sea waves are used to generate energy. The first tidal energy project in the world was started in France.

Industry : Europe is the birth place of modern industries. Due to advanced technology and skilled labor, industries like iron and steel and machinery etc grew on a large scale. The European countries are leading in the production of means of transport, paper, artificial fiber, electrical gadgets etc.

Environmental problems in Europe : Europe has to face many environmental problems because of mineral oil and coal, different types of industries and automobiles in large numbers. Water, noise and air pollution have increased in the European countries to a great extent. Efforts are being made to use technology to maintain the ecological balance.

Transport : The Autobahn in Germany is a famous European highway. One fourth of the total railways in the world are in Europe. The trains here are known for their quality and speed. The Trans Europe- Express connects all the nations in Western Europe.

A very long tunnel is dug though the Alps for vehicular traffic. Rotterdam in Netherlands is a world famous port.

Human life : Europe is known as a thickly populated continent. The literacy rate is very high among the Europeans and they have made a lot of progress in the fields of education, science and technology. Many languages are spoken in Europe which include about 29 major languages.

Important cities : London, Paris, Amsterdam, Moscow, Berlin, Rome, Geneva etc are the important cities.

Points to remember :

- Europe is known as the birthplace of the Western Civilization.
- Europe occupies 7.7% of the total area of the world.
- Glittertinden in Norway is the highest peak in this region.
- Mount Elbrus in the Caucasus Mountain is the highest peak in Europe.
- The Volga is the longest river in Europe.
- The major crop in the European continent is wheat.
- Norway is a major exporter of fish.
- The first tidal energy project in the world was started in France.
- The Autobahn in Germany is a famous European highway.
- Rotterdam in Netherlands is a world famous port.

Keywords:

Western civilization	Glittertinden	Sanctuaries
Hybrid cattle	Dogger Bank	Rotterdam
Great Fisher Bank		

Lesson - 23

South America

South America is the fourth largest continent in the world. The continent is located in the Western Hemisphere and mainly in the Southern Hemisphere.

Location, extend and boundaries :

The latitudinal extent of this continent is from 11 45 N to 55 52 S. Its longitudinal extent is from 34 45 W to 81 10 W.

Physiography : Mountains, plateaus and river basins are main physiographic divisions of this continent. Mountains and coastal plains generally run in a north-south direction, while highlands and river basins generally run in an east-west direction.

South America's primary mountain system, the Andes, is also the world's longest. The highest peak in the Andes is Aconcagua and it is the tallest mountain outside Asia. Outside the Andes, South America has two principal highland areas: the Brazilian Highlands and the Guiana Highlands.

South America has three important river basins: the Amazon, Orinoco, and Paraguay/Paraná. The Amazon River is the life force of the Amazon rain forest. It covers half of the rain forest of the entire planet.

Climate : The climate in most parts of the South America is usually **tropical.** The climate becomes subtropical as we move southwards. In the Amazon basin, the average rainfall is 2,000 mm and the climate in this part is hot and humid. In general, South America has a tropical, wet climate with hot temperatures and heavy rainfall.

Natural Resources

Water resources : The Amazon is the most important river of this continent, it originates in Andes mountain. The river flows so forcefully that while entering into the North Atlantic Ocean, it has given rise to large estuaries. In some parts, we find developments of large islands like Marajo.

Soils : The basin of the Parana, Paraguay and Uruguay forms the second largest basin of the South American continent. The alluvium brought by these rivers has made it a fertile basin. It is famous for agriculture produce such as corn, coffee, wheat, soyabean, cocoa and animal husbandry. Brazil in South America is the largest producer of coffee in the world.

Mineral Resources : In terms of mineral wealth the continent is quiet rich. Minerals such as iron ore, bauxite, copper, gold and diamonds are found here.

Environmental issues : There are many environmental issues currently increasing in South and Central America. Some of the most problematic issues are deforestation, pollution, overuse of pesticides and population explosion. These things are hurting the environment and are impacting the rest of the world as well.

Points to remember :

- The continent of South America is located in the Western Hemisphere and mainly in the Southern Hemisphere.
- South America's primary mountain system, the Andes, is also the world's longest.
- The highest peak in the Andes is Aconcagua and it is the tallest mountain outside Asia.
- Outside the Andes, South America has two principal highland areas: the Brazilian Highlands and the Guiana Highlands.
- The Amazon River is the life force of the Amazon rain forest.
- The climate in most parts of the South America is usually tropical.
- The Amazon is the most important river of this continent, it originates in Andes mountain.

Keywords:

Andes mountain	Aconcagua
Brazilian Highlands	Guiana Highlands
Amazon River	Marajo Island

Lesson - 24

Australia

Australia is the smallest inhabited continent in the southern hemisphere. It is the largest island in the world. In fact it is an island continent.

Physiography

Australia is divided into three major physical divisions – Western Plateau, Central Lowlands and the Eastern highlands. The highest mountain of Australia is **Mount Kosciuszko**. The **Great Barrier Reef** in Eastern Australia is the biggest coral reef in the world. Australian cities and farms are located in the southwest and southeast. Running around the eastern and south eastern edge of Australia is the Great Dividing Range. Australia has a range of different landscapes, including urban areas, mountain ranges, deserts and rain forests.

Climate

Australia lies mostly in tropical zone and the climate of most parts are too hot and dry. Australia being the only continent in the southern hemisphere experiences reverse climate than the continents in the northern hemisphere.

Natural Resources

Australia is rich in natural vegetation, wildlife and minerals. The continent has some of the unique plants and animal species. Eucalyptus, pine, thorny bushes, cacti, timber, gums are found in forests of this continent.

Australia is primarily an agricultural country. Farming is done using the most modern methods. Important agricultural crops are wheat, rice, cotton, sugarcane and fruits.




Australia is home to a variety of unique animals, including the koala, kangaroo, emu, kookaburra and platypus. Although they usually keep to themselves, there are a range of dangerous snakes in Australia, such as the Brown Snake, Tiger Snake and Taipan. Australia has over 750 different reptile species, more than any other country in the world.

Cattle farming, dairy farming and sheep rearing are important economic activities.

Minerals

It is the world's leading producer of **bauxite**, **limonite**, iron ore, rutile and **zircon**. Australia also has rich deposits of minerals such as **gold**, lead, lithium, manganese ore, zinc, uranium, black **coal**, **nickel** and **silver.**

It is estimated that humans have lived in Australia for around 45000 years. The indigenous people of Australia are Australian Aborigines.

Environmental Issues

One of the notable issues with marine conservation in Australia is the protection of the Great Barrier Reef. Australia is a relatively wealthy country with a high life expectancy. The largest cities in Australia are Sydney, Melbourne, Brisbane, Perth and Adelaide.

Points to remember :

- Australia is the smallest inhabited continent in the southern hemisphere.
- The highest mountain of Australia is **Mount Kosciuszko** .
- The **Great Barrier Reef** in Eastern Australia is the biggest coral reef in the world.
- Running around the eastern and southeastern edge of Australia is the Great Dividing Range.
- Australia is home to a variety of unique animals, including the koala, kangaroo, emu, kookaburra and platypus.

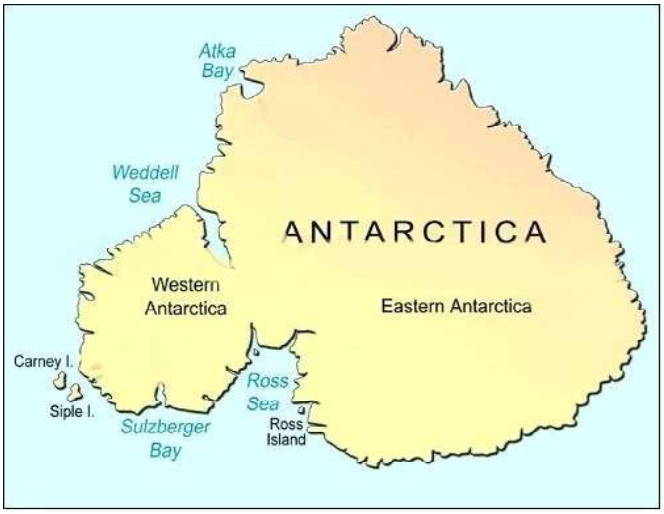
Keywords :

Mount Kosciuszko	Kookaburra
Great Barrier Reef	Platypus

Lesson - 25

Antarctica

The name 'Antarctica' comes from a Greek word meaning 'opposite to the north'. Antarctica is the southernmost continent on Earth. Antarctica is bigger than Europe and almost double the size of Australia.



Physiography :

The South Pole is found in Antarctica. Antarctica is surrounded by the Southern Ocean. Most of the Antarctica is covered in ice over 1.6 kilometers thick (1 mile). Since it experiences such little rain, Antarctica is considered a desert.

Climate- The coldest recorded temperature on Earth occurred in 1983 at Vostok Station, Antarctica, measuring a rather chilly "89.2 °C ("128.6 °F). While humans don't permanently reside in Antarctica, several thousand people live and work at various research facilities found on the continent.

Natural resources- Antarctica is a place of unlimited resource wealth. But the harsh climate, short work season, and thick ice make the recovery of these resources very difficult. The mineral deposit in this continent are coal, ice, petroleum, metallic mineral such as cobalt, iron, copper, nickel and chromium. Around 90% of the ice on Earth is found in Antarctica. Sea levels would rise around 60m (200ft) if all the ice in Antarctica were to melt.

While Antarctica features harsh living conditions, a number of plants and animals have adapted to survive and call the icy continent home. Well known animals that live in Antarctica include penguins and seals.

Environmental issues

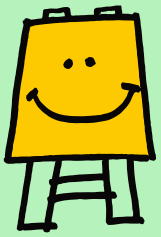
Global warming has resulted in warming of the sea and retreating of glaciers, loss of sea ice and land-based ice. An increase in footfall of people via tourism and infrastructure is a threat to the wildlife and the wider environment. Pollution has resulted in great suffering or loss of life by birds, fish and marine mammals.

Points to remember :

- The name 'Antarctica' comes from a Greek word meaning 'opposite to the north'.
- Antarctica is surrounded by the Southern Ocean.
- The coldest recorded temperature on Earth occurred in 1983 at Vostok Station, Antarctica.
- Well known animals that live in Antarctica include penguins and seals.

Keywords :

Antarctica	Vostok Station	Penguins
Seals	Tourism	Infrastructure
Global warming	Southern Ocean	



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