

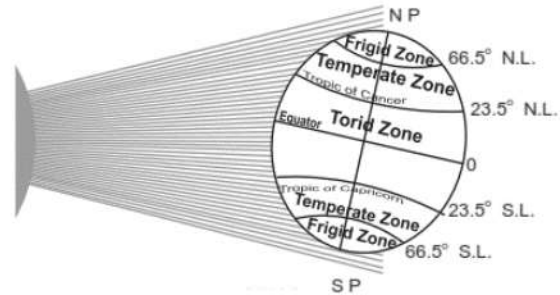
(1) EARTH-OUR HOME

The globe:

If you observe the globe, you will find horizontal and vertical lines drawn on it. These lines are actually not drawn on the earth and are imaginary lines. The horizontal lines are called Latitudes and the vertical lines are called Longitudes.



Climate-zone: The earth is divided into various zones according to the temperature and the heat of the sun. These zones are called “Climatic Zones or Heat Zones”. The fig. shows the climatic zones of the earth. We can divide the earth into three zones according to the amount of heat received.



CLIMATIC ZONES

Torrid Zone

Extreme heat
Heavy rainfall
High temperature
Varied vegetation
Varied animals

Temperate Zone

Moderate heat
Moderate rain
Moderate temperature
Few varieties of flora and fauna

Frigid Zone

Extreme cold
No rainfall
Nine months covered with ice
Scanty grass

(2) GUJARAT: LOCATION, BOUNDARY

The state of Gujarat is located in the western part of India. It is flanked by the Arabian Sea in the west. The state of Gujarat lies between 20.06' North latitude and 24.42' North latitude. Similarly, it lies between 68.10' East longitude and 74.28' East longitude.

Boundaries

Gujarat has two types of boundaries: 1. Sea boundary 2. Land boundary

1. Sea boundary

The Arabian Sea lies to the west of Gujarat. The sea boundary is 1,600 km long and is the longest sea boundary among all states of India. The boundary has the Gulf of Khambhat and the Gulf of Kutch.



2. Land boundary

Madhya Pradesh is in the east, Arabian Sea in the west, Rajasthan in the north, Dadra and Nagar Haveli and Daman and Diu in the south and Pakistan in the north-west.

The north-south length of Gujarat is 590 km and the east-west length is 500 km. The geographical area of Gujarat is 196,024 sq. km which is only 6% of India's total area.

The land area of Gujarat is divided into four parts:

1. North Gujarat;
2. South Gujarat;
3. Central Gujarat; and
4. Saurashtra - Kutch.

Name the districts of Gujarat through which the Tropic of Cancer passes are Kutch, Surendranagar, Ahmedabad, Mehsana and Sabarkantha.

(3) PHYSIOGRAPHY OF GUJARAT

Physiography refers to the various land forms. The physiography of Gujarat state is varied. We can divide it into 5 parts. 1. Plains 2. Hilly and Mountainous Areas 3. Plateaus 4. Deserts 5. Coastal Plains

1. Plains

The major part of Gujarat consists of plains. These plains are made up of alluvial soil and are therefore very fertile. The plains of south Gujarat and central Gujarat are more fertile. The population is also very dense here.

2. Hilly and Mountainous Areas

The hills and mountains are divided into three regions 1. Tal Gujarat Hills 2. Saurashtra Hills 3. Kutch Hills

3. Plateaus

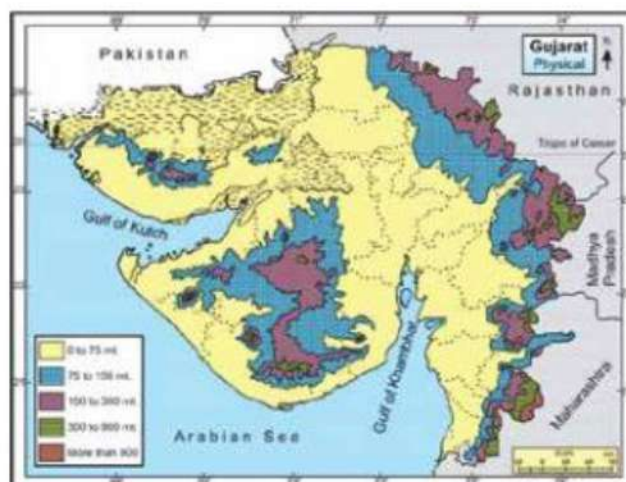
Plateaus are landforms which are higher than the sea level and are flat like plains in the upper part. The middle part of Kutch and Saurashtra are plateaus. The plateau of Saurashtra is high in the middle while sloping and low towards the sea shore.

4. Deserts

The deserts of Kutch are not sandy but full of salt. From a distance, on a moonlit night, the area looks like a white bedcover.

5. Coastal Plains

Gujarat state has a coastline of 1,600 km which is very useful for international trade. During the past, international trade was carried out through the ports of Khambhat, Ghogha, Bharuch and presently through the port of Kandla.



(4) THE CLIMATE AND WATER RESOURCES OF GUJARAT

We experience different climatic conditions in the different seasons. We experience severe cold in winter and severe heat in summer. We also experience heavy rainfall during monsoon. So, it can be concluded that there are mainly three seasons. (1) Winter (2) Summer (3) Monsoon. In all these three seasons we experience different climate and temperature.

Climate

The average weather conditions like consistent temperature and humidity for a specific period of time is called climate. Gujarat experiences variations in climate. Maximum part of land of Gujarat lies in the Torrid Zone, therefore it experiences hot summers and cold winters. The sea shores of Gujarat experience less heat in summer, less cold in winter and more rainfall during monsoon. So it is said to have moderate climate. The shores experience oceanic climate. The tourist centres near the coast like Tithal, Ubharaat, Naargol, Chorwad, Prabhaspatan, Ahmedpur Mandavi (Kutch) are such places.

The characteristics of the climate of Gujarat

Winter

The temperature is low in almost all the places of Gujarat from December to February. Generally, the atmosphere is cold during winter season. Minimum temperature is experienced in winter season in the month of January. Cold and stormy winds blow from the Central Sea over Gujarat due to which some parts of Gujarat experience little bit of rainfall which is called 'Shower'. ('Mavthu' in gujarati).

Summer

The temperature remains high from March to May in Gujarat. Highest temperature is experienced in May. In many parts of Gujarat, temperature reaches up to 45°C. The temperature is moderate near the coastal areas due to waves and tides.

Monsoon

After May, due to the south-west monsoon winds, the proportion of humidity increases in the air and it results in rainfall from June to September and is known as the Rainy Season. From the 2nd or 3rd week of June, the monsoon season starts with thunder and storm. Sometimes, the wind blows at the speed of 100 km/hr. Such cyclonic winds cause heavy destruction near the coastal areas.

Natural Resources

The different types of materials that can be drawn on when needed are called Resources. We build houses to live and buy clothes to wear. These are called finished products which are made with the help of different resources. Many resources are gifted to us by nature and are called 'Natural Resources'. The economic development of each state mainly depends upon the availability of the natural resources in that state. Nature has gifted us rivers, lakes, air, sunlight, forest, animals, birds, mountains

Water Resources

Gujarat is endowed with several rivers, lakes, wells, step wells, streams, ponds and oceans. There are rivers like the Banas, Saraswati, Rupen, Meshwo, Sabarmati, Vatrak, Mahi, Vishwamitra, Dhadhar, Narmada, Kim, Tapi, Purna, Kaveri, Kankavati, Bhakhi, Aaji, Bhudar, Shetrunji, Machchhu, etc. Some rivers of north Gujarat like the Banas, Saraswati and Rupen drain into the small Rann of Kutch. That is why they are called Inland Rivers. The main rivers

of Gujarat are the Narmada, Tapi, Mahi and Sabarmati. The Narmada is the longest river of Gujarat. The coastline of Gujarat is approximately 1600 km long. There are 40 big and small ports on the seacoast of Gujarat; the main ports are Kandla, Bhavnagar, Porbandar, Veraval, Okha, Bedi, Navlakhi, Mundra, Pipavav, Poshitra, Dahej, Magdalla and Hajira. Kandla is the biggest port among the other ports of Gujarat.

Do you know about the Multipurpose projects of Gujarat?		Do you know about the lakes of Gujarat?	
Name of River	Name of Irrigation Project	District	Name of Sarovar
The Tapi	Ukai Project; Kakarapar Project	Kutch	Narayan Sarovar
The Mahi	Kadana Project; Vanakbori Project	Vadodara	Ajwa Sarovar
The Sabarmati	Dharoi Project	Ahmedabad & Surendranagar	Nal Sarovar
The Banas	Dantiwada Project		
The Shetrunji	Shetrunji Project	Narmada	Sardar Sarovar
The Narmada	Sardar-Sarovar Project		
The Bhadar	Bhadar Project		

(5) FOREST AND MINERALS RESOURCES OF GUJARAT

Due to the varied climatic conditions and topography of Gujarat, the forests of Gujarat are classified into four Categories.

Equatorial Forests

These forests are found in the areas that experience 120 cms. or more rainfall.

Arid Forests

These forests are found in the area that experience moderate rainfall i.e. 60 to 120cms.

Thorny Forests

These forests are found in the area that experience less than 60 cms of rainfall i.e. in the northern dry regions.

Mangrove Forests (Tidal Forests)

These forests are found in the western regions of Kutch and along the muddy shores.

Four types of Forests	Districts	Trees of Forest
Equatorial Forests	Navasari, Valsad, Dang, Panchmahal, Dahod, Narmada, Junagadh	Teak, Saal, Bamboo, Sesame (black tree providing timber) Shlimlo (tree which gives silk-like soft cotton). Sadad, Biyo, Shiras, Haldarvo, Dhavado, Modad, Timru, Khakhara, Kher, etc.
Arid Forests	Jamnagar, Vadodara, Dahod, Narmada, Junagadh, Amreli	Teak, Bamboo, Kher, Baval, Shimalo, Timru, Kesudo, Neem
Thorny Forests	Kutch, Rajkot, Bhavnagar, Junagadh, Banaskantha	Baval, Modad, Thor, Boradi, Sadad, Khakhara, Rayan, Neem, Umardo, Garmado
Mangrove (Tidal Forests)	Jamnagar, Junagadh, Kutch	Cher trees and high grass lands

MINERALS RESOURCES

Gujarat is rich in minerals. The minerals available in Gujarat have contributed in the rapid development of industries. The minerals found in Gujarat are limestone, china clay, dolomite, bauxite, fluorspar, gypsum, akik, lignite, silica, copper, zinc, lead, manganese, bentonite, graphite, mineral oil, natural gas, etc.

Sr. No.	Mineral	Districts where minerals are available	Use of mineral
1.	China clay	Sabarkantha, Mehsana, Surat, Panchmahal	Paper, textile, pesticides, plastic, used in cosmetics and cement industries.
2.	Fluorspar	Vadodara, Bharuch	Fluorspar is very useful for melting metals. (It is available only in Gujarat in entire Asia.)
3.	Limestone	Junagadh, Jamnagar, Kutch, Kheda, Amreli, Banaskantha, Bharuch, Surat, Panchmahal, Sabarkantha, Bhavnagar	Used in industries like Cement, Iron, Steel, Soda Ash, Paper, Colour, purification of sugar, etc.
4.	Bauxite	Kutch, Jamnagar, Junagadh, Amreli, Valsad, Kheda, Sabarkantha, Panchmahal, Bhavnagar, Porbandar	Bauxite is used in aluminium based Industries.
5.	Dolomite	Vadodara, Amreli, Banaskantha, Bharuch, Sabarkantha, Narmada	Used in glass, Steel, Fertilizer, Mosaic Tiles and to purify sea water.
6.	Gypsum	Jamnagar, Junagadh, Kutch, Amreli	Chemical Fertilizer, Glass, Colour, Pesticide Industries.
7.	Akik	Kutch, Bharuch, Bhavnagar, Khambhat	Used in making ornaments.
8.	Lignite	Kutch, Bharuch, Mehsana, Bhavnagar, Surat	Used for producing solar electricity and tar and Chemical Industries.
9.	Graphite	Vadodara, Panchmahal, Dahod	Thermocol, Pencil, Explosives, dry battery, etc.
10.	Copper, Zinc, lead	Banaskantha	Copper is used to make electricity wire, gold ornaments and vessels. Zinc is used to make storage battery and zinc oxide. Lead is used for coating galvanized sheets and vessels.
11.	Mineral oil and Natural gas	Ahmedabad, Kheda, Bharuch, Gandhinagar, Mehsana, Surat, Vadodara	Used in diesel, Petrol, Naphtha, Kerosene, Colours, tar, artificial fibre and Petroleum gas Industries.

(6) INDIA: LOCATION, BORDER, AREA AND PHYSIOGRAPHY

India lies between 8.4° N latitudes to 37.6° N latitudes and 68.7° E to 97.25° N longitudes.

Border

India shares its border with seven countries- Afghanistan and Pakistan to the North-West, China, Bhutan and Nepal to the North, Myanmar to the far East and Bangladesh to the East. Sri Lanka (from the South-East) and Maldives (from the South-West) are two countries with water borders.

Area

India extends from Kashmir in the north to Kanyakumari in the south and covers a distance of 3214 km. from north to south. It extends from Arunachal Pradesh in the east to Dwarka in the west and covers 2933 km. from east to west. The land area of India is approximately 32,87,263 square km. Hence India is considered as the seventh largest country in the world in terms of land area. India tapers towards the north and the south and is relatively broader in the center. There are 29 states and 7 Union territories, including New Delhi, the capital of India.

Physiography

The landform of India is not uniform everywhere. On the basis of variations in the landforms, India can be divided into following five physiographic divisions:

- (1) Northern mountain Range
- (2) Plains of North India
- (3) Central and Deccan Plateaus of India
- (4) Coastal plains
- (5) Islands/Archipelagos
- (6) Indian Deserts

1. Northern Mountain Range

The Himalayas is a chain of three mountains and is called the Himalayan mountain range. It is the highest mountain range in the world. There are two divisions of the northern mountain range:

- (1) Himalayan mountain range
- (2) Eastern Himalayas or Purvachal range

There are three distinct and parallel ranges. The northern most range towards China is known as the Greater Himalayas; the Central Himalayas lie in the centre and the range towards India is called Shivalik Range.

1.1 Mountain Ranges of Himalaya: Mt Godwin Austin peak of India is 8611 meters high.

It lies in the Karakoram range. Mt Everest (8848 meters) is the highest peak in the world which is located in the Himalayan range in Nepal. Kanchanjungha (8518 meters), Nandadevi (7817

meters) and Badrinath (7138 meters) are high peaks located in the mountainous region of the

Himalayas in India.

1.2 Mountainous regions of Eastern Himalayas: The eastern part of the Himalayas is mountainous. Patkoi and Lushai (very high) hills form parts of the eastern Himalayas, whereas Garo, Khasi, Jaintia and Naga (the not so high) hills form parts of the southern Himalayas from the east-west direction.

2. Plains of North India

The plains to the South of the Northern Mountain Range are formed by the alluvium brought by the Himalayan and peninsular rivers. They cover the vast area of northern India. That is why they are known as the plains of North India. The plains made by the rivers are so vast that it is one of the largest plains in the world formed by the rivers. Due to the vastness of these plains, it is one of the most prosperous and populated areas of India.

(7) ROCKS AND MINERALS

The types of rocks vary, depending on their properties, particle size and formation process. In terms of formation process, rocks are of three types:

(i) Igneous Rock:

Hot magma cools and solidifies. A rock formed in this way is called igneous rock. There are two types of Igneous rocks: Inner Rock and Outer Rock.

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

(ii) Sedimentary Rocks:

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

(iii) Metamorphic Rocks:

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

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

Rocks are very useful to us. The solid rocks are used for making roads, houses, and buildings. Rocks are made up of different minerals. Minerals are naturally occurring substances which

have certain physical property and definite chemical composition. Minerals are very important to mankind. Some are used as fuels. For example, coal, natural gas, mineral oil and petroleum. They are used in various industries and even for making medicines. Like iron, aluminum, gold, uranium etc.

(8) FORMATION OF LANDFORMS

The lithosphere is broken into a number of plates known as lithospheric plates. You will be surprised to know that these plates move in different direction i.e few millimeters in a year. This is because of the molten magma inside the earth. The molten magma inside the earth moves in a circular manner.

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

Endogenic forces sometimes produce sudden movements and sometimes produce slow movement. Sudden movements like earthquakes and volcanoes cause changes on the surface of the earth. A volcano is a vent (opening) in the earth's crust through which molten material erupts suddenly.

Similarly, when the lithospheric plates move, the surface of the earth vibrates. The vibration can travel all round it's centre. These vibrations are called 'earthquake'. The place in the crust from where the vibration starts is called the focus'. The vibration travels in the form of wave outside the centre of origin. The centre of the surface closest to the centre of origin is called 'epicentre'. Greatest damage is usually caused, closest to the epicentre and as the distance from the epicentre increases, the magnitude of the earthquake gradually decreases.

Although, earthquake cannot be predicted, the impact can be minimized if we are prepared beforehand. Local people use some common methods to predict possibility of earthquake, like study of behaviour of animals, rapid movements of fish in pond, coming out of reptiles on the surface of the earth etc.

(9) LOCATION AND TIME

What are these vertical and horizontal lines on the globe of the Earth? They are imaginary lines and are not drawn on the surface of the Earth. The horizontal lines are called Latitudes and the vertical lines are known as Longitudes. Latitude is an angle which ranges from 0° at the Equator to 90° (North or South) at the poles. Lines of Latitude, run east-west as circles parallel to the equator.

The Equator is the middle latitude or the 0° latitude which divides the earth into Northern and Southern Hemisphere. The part of the Earth that lies to the north of the 0° (Equator) latitude is called the Northern Hemisphere and the part that lies to its south is known as the Southern Hemisphere.

Longitudes and longitudinal coordinates of a place

The vertical imaginary lines drawn on a globe that run in the north-south direction are known as longitudes.



World Map

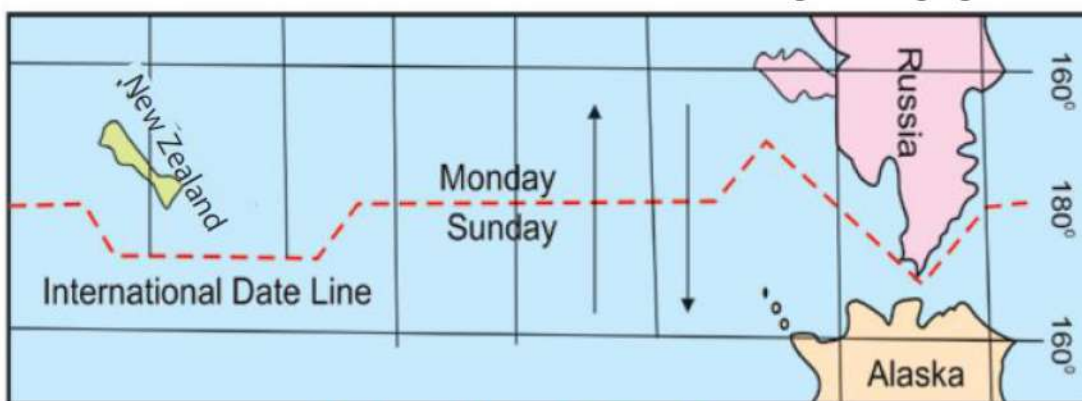
Major Longitudes

1. Prime Meridian (Greenwich)

The 0° longitude that passes through Greenwich in England is known as 'Prime Meridian'. It divides the earth into two vertical halves - eastern hemisphere and western hemisphere. It has longitudes extending up to 180° on both eastern and western sides. Since it passes through Greenwich, it is generally referred to as the Prime Meridian as well.

2. International Date Line

There is only one 180° longitude which is known as the International Date Line. When one crosses this line, the day and date changes. The International Date Line passes through the Pacific Ocean and separates two calendar dates. It is not exactly 180° at all places since the line crisscrosses across several time zones. This is because if it is drawn straight, then the line has to pass through many islands and due to this they might have two days and two dates on the same island. This might create confusion. Therefore, the line, when it passes over land, is shifted towards water bodies and so it is not straight but zigzag.



International Date Line

The sun is the biggest clock of the earth. The time at any place is decided by the position of the sun in the sky and its longitude. The earth completes one rotation in 24 hours. There are 360 longitudes in all (180 to the east of the Prime Meridian and 180 to its west). In this way, 15 longitudes pass by the sun in one hour. One longitude takes 4 minutes to rotate. Thus, there is difference of 4 minutes between two adjacent longitudes. Therefore, the time in different places on the earth varies as per their longitudes.

Local Time

The time taken according to the overhead position of the Sun in a particular place is known as the local time of that place. It differs by 4 minutes with every one-degree longitude. When any longitude faces the sun (directly) it would be 12:00 noon in all the places on that longitude. In this way, the local time of the place is decided according to mid-noon. The places located on the same longitude have the same time and places located at different longitudes, in the same country, have different times.

In a country, if the local time is different in different places, it can create problems in administration. How can one work in such situation? What must one do to solve this problem? Let us understand.

Standard Time

The local time of a place which is situated in the middle of the country is taken as the standard time of the country. This means that time is fixed on the basis of a particular longitude in a country, which is known as 'Standard Time'. The Standard Time of our country is decided on the basis of 82.5° E longitude, which passes through Allahabad (in Uttar Pradesh). This means that if it is 12:00 noon in Allahabad, it is 12:00 noon everywhere in the country. This makes it convenient for the smooth administration of the country.

(10) POLLUTION

Human beings use their intellect to use various components of the environment to satisfy their needs. Mahatma Gandhi said that pollution is the act of polluting the natural environment through human activities. Components polluting the environment are called pollutants. The environment is polluted when resources are used unrestrictedly and indiscriminately. The sharp zest of human development, industrialization and mechanization are responsible for pollution of environment.

At present land pollution, water pollution, air pollution and noise pollution are increasing very fast. Pollution causes an adverse effect on the environment, human life and living things. We need to take immediate steps to preserve the environment, and prevent its harmful effects.

Water Pollution: Industries require water and during the process of manufacturing, water becomes impure / polluted which is drained into rivers, streams or on the ground. This chemical infested water pollutes the pure water of a river. Secondly, the water drained on open ground gradually percolates down and pollutes the underground water too. Growing urbanization is another reason behind widespread pollution. Dirty water from the gutters in urban areas is released into rivers and ponds which add to the problem of water pollution. Today even the rain water gets polluted due to industrialization. The smoke and gases released by the industries mix with the rain water and pollute it. The dirty water released by industries and factories into rivers, streams and ponds destroys aquatic life. Many times, we see news about mass death of fish because of excessive pollution in water. The sea water gets polluted due to oil drilling and oil spills.

Water pollution causes various diseases like cholera, jaundice, vomiting, loose motion etc. That is why nowadays people have to carry their own water bottle, filled with fresh and filtered

water, with them while travelling, to office or to school. Many rivers have turned into gutters. This polluted river water is used for agriculture and consequently pollutants enter into food grains, vegetables and fodder. People from every class of the society, be it a politician, farmer, industrialist, educated individuals, artist or workers have a very casual attitude towards the environmental pollution. The water from industries should be purified before it is drained into streams or rivers. Government should implement the pollution control policies properly to control the industries. We should use water in a judicious way.

Land Pollution: A change in soil quality or its nutrients is called land pollution. Land pollution is not easily felt. Land pollution is on rise around the world. Disposal of household solid waste or water, setting up of industries on fertile or agricultural land, discharge of contaminated water used in industries on open land, disposal of industrial solid waste on land, excavation activities, construction activities, use of chemical fertilizer for agriculture, over-irrigation and over usage of insecticides along with it as well as use of plastic are responsible for land pollution.

Measures to Prevent Soil Pollution:

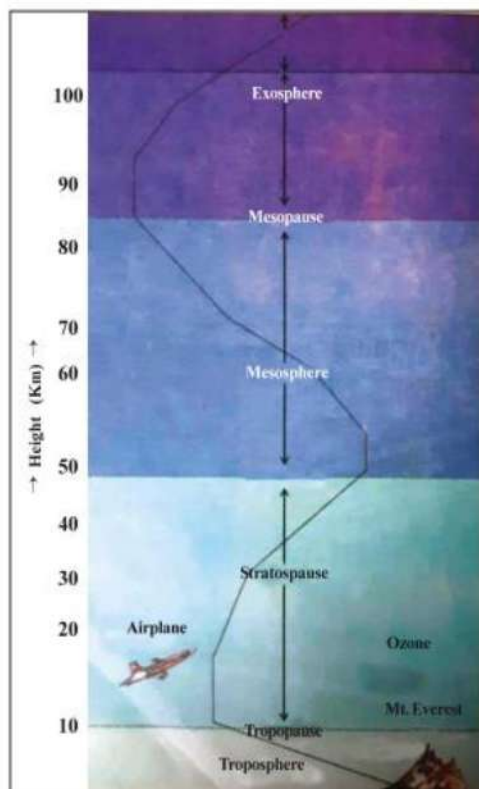
- Instead of pesticides and chemical fertilizers, organic and indigenous fertilizer, green manure should be used.
- Pesticides should be used sparingly.
- Solid waste should be sorted and reused.
- Plastic/Solid waste should be recycled and reused.
- Drip and Sprinkler irrigation system should be used in agriculture.

(11) FORMATION OF ATMOSPHERIC LAYER

As the altitude extends upward from the surface of the earth, the atmosphere is divided into different layers depending on the change in temperature and composition of gases. On the basis of this change it is divided into four sub layers (1) Troposphere (2) Stratosphere (3) Mesosphere (4) Thermosphere.

(1) Troposphere: The first layer of the atmosphere that surrounds the earth is called 'troposphere'. It extends up to an altitude of approximately 16 km at the equator, about 12 km in the temperate zone and 8 km at the poles. Changes occur in it according to the seasons. This layer is very important for the ecosystem. Atmospheric storms, sound waves, wind formation, lightening, rain, clouds, etc occur in this layer. In this layer, the temperature decreases at the rate of 6.5°C per km of altitude. At the height where temperature stops decreasing, that limit is called troposphere limit.

(2) Stratosphere: The layer above the troposphere is called stratosphere which extends from the troposphere to a height of about 50 km. In this layer as the height increases, temperature also increases. Seasons, clouds, rain, cyclone, etc. are not seen in this layer. The air is clean



Formation of atmospheric layer

and thin here so the jet plane can fly faster with less obstruction. At an altitude of about 15 km to 35 km the amount of ozone gas is more which absorbs the sun's extremely hot ultra violet rays.

(3) Mesosphere: The part of atmosphere up to an altitude of about 80 km above the stratosphere is called 'Mesosphere'. Here, the temperature decreases with the increasing altitude.

(4) Thermosphere: This layer is located above the mesosphere starting from 80 km. It is extended upto the completion of atmosphere. Here the air is extremely thin. As we go higher and higher, atmospheric temperature increases. This layer is divided into two sub-divisions: Ionosphere and Exosphere. The radio waves are reflected from Ionosphere. TV, radio-broadcasting, advantage of internet is indebted to this layer. The layer above the Ionosphere is called Exosphere.

(12) TYPES OF FOREST

(1) Tropical Evergreen Forests: These forests are also called tropical rain forests. These dense forests are found in the equator and the tropics. The climate of this region is hot and humid due to heavy rainfall throughout the year. The leaves of the plants of this region do not fall together, they remain green throughout the year and thus they are called evergreen forests. In this forest rosewood, Ebony, Mahogany, etc. are found. In India, these types of forests are found in the Andaman and Nicobar Islands.

(2) Tropical Deciduous Forest: Tropical forests are also called deciduous forest. In this region, the climate is hot and the amount of rain is less. In the summer season within 6 to 8 weeks the leaves of the plant fall off from trees. It is known as 'deciduous forest'. In this forest hard timber plants like teak, sal, neem, sesame etc. are grown. These forests are found in the highlands of India, hilly areas, North Australia and such types of vegetation are found in a large part of Central America. In these forests animals like tigers, Asian lions, elephant, golden monkey etc. are found. In this region peacocks, hawks, parrots, pigeons, mainas are found in large numbers.

(3) Temperate Evergreen Forests: In this region, temperature is even and rainfall is heavy. In this region, evergreen forests are found. These forests are found in South-East America, South China and South-East Brazil as well as in the North-eastern mountainous region of India. The main plants that are grown in the forests are bamboo, pine and eucalyptus. In this forest elephants, one-horned rhinos etc. animals are found.

(4) Temperate Tropical Forests: These forests are found the North of Tropic of cancer and in the south regions of Tropic of Capricorn. These forests are found in North-East America, China, New Zealand, Chile and Western Europe as well as in North India. In these forests major plants like Oak, Maple is found. Animals like deer, fox, wolves are found in these forests.

(5) Mediterranean Forests: These forests are found in the region near the Mediterranean Sea which is found mostly in Europe. Africa, Asia continent. The climate of this region is hot-dry in summer. cold and moist in winter. Citrus fruit plants like oranges, figs, olives, grapes etc. are found in these regions.

(6) Coniferous Forests: These forests are found in a region with cold climate of about 50° to 70° North latitudes as well as in high mountain regions. The vegetations of these forests are in a conical shape. In these forests pine, cedar, fir etc. are the main plants. The wood of these plants is soft and fluffy. It is used more in paper, matchsticks or in packing. In this region animals like monkeys, polar bears, musk deer, yaks are found.

(13) WILDLIFE RESOURCE

India's wildlife is diverse. Various species of insects and various animals of the world are found in India. There is also a lot of diversity in the species of birds and fishes. Extreme diversity is found in reptiles, mammals and amphibians.

- Kashmiri deer and wild goats are found in Jammu Kashmir and Ladakh.
- Elephants are found in Uttarakhand, Karnataka, Kerala, Assam etc.
- The one-horned Rhinoceros is a unique animal of India. It inhabits in Assam and in swampy region of West Bengal.
- Ghudkhars (Wild donkeys) are found in the little rann of Kutch and the adjoining area.
- India is the only country where all three animals like lions, leopards and tigers are found. The Lions live in the forests of Gir in Gujarat.
- Tigers are found in West Bengal, Mandhya Pradesh, Maharashtra, Karnataka, Rajasthan and in different regions of Himalayas. Royal Bengal Tiger (Tiger of Bengal) is one of the eight species in the world.
- Bears are found in Danta, Jessore, Vijaynagar, in the area of Dediapada and Ratanmahal in Gujarat.
- Birds species like ducks, parrots, kabars, pigeons, myna, etc. are found in large numbers in India. Nalsarovar in Gujarat is famous for its migratory birds in winter. Flamingo (Surkhab) is the state bird of Gujarat.
- Mackerel, Prawn, Boomla, Shark, Dolphin, Salmon etc.. these species of fish are found in the coastal areas of India.
- In India, different types of deer and many species of snakes are found.
- Red pandas are found in the snow forests of the Himalayas.

Endangered Wildlife

Tigers from the forests of Gujarat and Cheetah from the forests of India are extinct. Some endangered species, including the birds like sparrow, vulture, stork, owl, crane and animals

like Gharial-crocodile. Gangetic-dolphin are on the verge of extinction. Otters found in the rivers of Gujarat like Narmada. Tapi and Sabarmati etc are in danger.

Wildlife Conservation

Laws have been enacted to protect wildlife for centuries. History records that emperor Ashoka enacted laws to protect wildlife. Even today, there are laws for the same 'State Wildlife' is formed in most of the states. Other voluntary organizations also work for it.

Following legal steps should be taken for wildlife conservation:

- Strict enforcement to stop/ to curb wildlife atrocities and poaching.
- Wildlife in the forest should be counted after a certain interval.
- Forests provide natural protection to wildlife so destruction of forest should be prevented.
- People should be explained the importance of wildlife conservation.
- Make quick efforts to extinguish forest fires.
- Make efforts to provide medical treatment to wildlife.
- Develop protected areas for wildlife.
- Awareness should be brought through the media.
- An adequate supply of water, food and natural habitat should be arranged for the wild life.

(14) SPHERES OF THE EARTH

Our Earth is one of the members of the solar family. The most important point is that only the Earth among all the members of the solar family has got the suitable temperature, water and air to sustain living beings.” Generally, it is believed that part of Sun, which has been detached from the Sun after the collision; is Earth. At the time of its origin, it was in the form of a fireball. This fireball started to cool down slowly. Many elements of the Earth got transformed into liquid and further into solid form. During this process, the elements which got transformed into solid are known as the lithosphere. The elements which got transformed into liquid are known as the hydrosphere. The elements which transformed into gases came to be known as the atmosphere. Above all, the living world which developed due to land, water and air came to be known as the Biosphere. In this way, the four spheres came into existence on Earth.

Lithosphere

The sphere on which we live is known as the lithosphere. ‘Litho’ means rock and ‘sphere’ means layer. The upper layer of the Earth is made of soil and solid materials like rock. Approximately 29% of the surface of the Earth is covered with lithosphere. This layer is almost 64 km to 100 km thick. The thickness of the lithosphere is not the same everywhere on the earth. Similarly, their interior and exterior do not have identical physical features. It is mostly made up of substances like soil and rocks. Land forms like mountains, plateaus, plains and valleys are seen on the lithosphere. The temperature increases as we move towards the center of the Earth. The molten rocks in the interior of the Earth are known as Magma. There are many gases present in the interior of the Earth which rise up with pressure and heat. But the pressure of rocks of the surface of the Earth is equally strong. Thus, balance between the two is maintained. So, the crust of the Earth does not break. When the balance between the two is not maintained the crust breaks and a volcano erupts.

Hydrosphere

Now, let me talk to you about Hydrosphere. The Hydrosphere is the liquid component of the Earth. It includes the oceans, seas, lakes, ponds, rivers and streams. On the surface of the Earth, the area of water is more than that of land. Hydrosphere covers 71% of the Earth's surface. A water body in hydrosphere that carries a huge amount of water is known as the ocean. These oceans are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean and the Arctic Ocean. All these oceans are connected with each other. The water bodies close to the land are known as seas, bays, straits, gulfs, etc. The oceans on the earth are huge and deep. Valleys with depth of 10 to 11 kms are located at their bottom. The ocean bed has similar features like that of the surface of the Earth. It has high mountains, plateaus, vast plains, valleys, etc.

Oceans contain 97% of the total amount of water on the earth. Approximately 1/3 of remaining water is trapped in ice-caps and glaciers (at Poles, Himalayas and other mountains). Some water is accumulated in the lakes and some flows in the rivers and some is stored in the interior of Earth as ground water. The amount of potable (fit for drinking) water is less. Fresh water is precious. This Fresh water is required by living beings for their existence. The moisture for rain, which is the main source of fresh water, comes from the oceans only. Valuable chemicals, minerals, salt, fishes, etc. are found in the seas. As we have living organisms on the land, in the same way, the seas and oceans have aquatic life inside them. The tremendous force of waves, tides and currents of oceans are potential sources for generating electricity. Besides, these oceans are also useful as waterways.

Atmosphere

The sphere of air that wraps the Earth from all sides is called Atmosphere. It extends approximately upto 1600 km from the surface of Earth. It cannot be seen clearly with the naked eye like Lithosphere and Hydrosphere. Atmosphere is composed of various gases, water vapour, dust particles, smoke, salt, microorganisms etc. Atmosphere is colourless, odourless and transparent. Solid, liquid and gaseous elements are included in the Atmosphere. It contains approximately 78% nitrogen, 21% oxygen and 1% other gases. When we go higher from the surface of the Earth, the amount of most of the gases in the atmosphere decreases. Carbon dioxide gas is heavy so it is found more in the lower layer of the air. Ozone gas comprises of a very small proportion in the air. This gas absorbs the ultraviolet rays from the Sun and protects the Earth from excessive heat of Sun. This gas is more in proportion in the morning in the open ground and in the air near the sea.

Gases like oxygen and nitrogen keep the living creatures on the Earth alive. Nitrogen reduces the intensity of oxygen.

Water is the most important component in the atmosphere. Due to heat, the water in the form of vapour evaporates and mixes with air which is known as moisture. The process of cooling of vapour is called condensation. Various forms of moisture like dew, fog, clouds and precipitation are due to condensation. The effect of atmosphere is seen on human beings in every aspect of life such as in their food habits, clothing, habitat, colour, economic activities, etc. Many dust particles are seen in the atmosphere. Spreading of Sunrays are visible due to these particles. It is due to dust particles that it does not suddenly turn dark after the sunset and it does not suddenly turn bright after the sunrise. The sunrays are reflected back with the help of these dust particles on the surface of the Earth and we receive the light of the Sun. We are

able to listen to the sounds due to the presence of atmosphere. That is why radio and Doordarshan telecast is possible.

(15) ENVIRONMENTAL CHANGES

The air that envelopes the Earth from all sides is known as atmosphere. The atmosphere is getting polluted due to human activities. The environment gets polluted due to industries, factories, power stations and vehicles. The changes that occur in temperature, direction of wind, moisture, etc. due to global warming are known as environmental changes.

What is weather?

The condition of temperature, rain and moisture (humidity) in any region at a particular point of time is known as weather. What would be the weather of this place? Write your answer in your notebook after carefully observing the given maps.

What is climate?

The average condition of rain, temperature and moisture for over more than 35 years in any is known as climate.

Greenhouse Farming

Countries with a cold climate receive less heat from the sun. This hampers the growth of plants and vegetables. Hence, arrangements are made to accumulate adequate heat from the sun. The roof is made of either glass or cloth to allow the sunrays to penetrate and sustain the heat inside the building, and this practice is known as the 'Green Huse Farming'.

What is Global warming?

Global warming refers to an unequal and continual rise in the average temperature of Earth's climate system due to the greenhouse gases. It occurs when certain gases in the atmosphere entrap infrared radiation (U V rays). This effect makes the planet warmer which subsequently reaches to Global warming.

How does the Earth get heated?

The greenhouse gases like carbon dioxide, Methane, Nitrous Oxide, Chloro Fluro Carbon (CFC) and halo carbons play an active role in the Greenhouse effect. The increase in the proportion of these gases leads to the problem of global warming and climate change. Increase in the temperature by 0.6°C in the last 100 years.

Effects of global warming

Changes are observed in the growth and development of the vegetation. Certain species of birds are now disappearing, such as sparrows and vultures. 2000 glaciers of Himalayas have receded / melted.