

MAJOR DOMAINS OF THE EARTH

MAJOR REALMS OF EARTH

The surface of the earth is a complex zone in which three main components of the environment meet, overlap and interact. The solid portion of the earth on which we live is called the Lithosphere. The gaseous layers that surround the earth, is the Atmosphere, where oxygen, nitrogen, carbondioxide and other gases are found. Water covers a very big area of the earth's surface and this area is called the Hydrosphere. The Hydrosphere comprises water in all its forms, that is, ice, water and water vapour.

The Biosphere is the narrow zone where we find land, water and air together, which contains all forms of life.

LITHOSPHERE

The solid portion of the earth is called the Lithosphere. It comprises the rocks of the earth's crust and the thin layers of soil that contain nutrient elements which sustain organisms.

There are two main divisions of the earth's surface. The large landmasses are known as the continents and the huge water bodies are called the ocean basins. All the oceans of the world are connected with one another. Look at the map of the world. Are all the land masses connected with one another?

The level of seawater remains the same everywhere. Elevation of land is measured from the level of the sea, which is taken as zero.

The highest mountain peak Mt. Everest is 8,848 metres above the sea level. The greatest depth of 11,022 metres is recorded at Mariana Trench in the Pacific Ocean.



The World : Continents and Oceans



CONTINENTS

There are seven continents on the earth.

In order of their size they are - (1) Asia (2) Africa (3) North America (4) South America (5) Antarctica (6) Europe (7) Australia. Their size and population is given as under.

Asia is the largest continent on the earth and it occupies about one-third the land of the world. About 58% of the people of the world live in Asia. There are now more than 46 countries in Asia. Our country is one of them.

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In fact, Asia and Europe together belong to the same landmass. They are not separated by a large watermass. Ural mountains and the Ural river separate Europe from Asia. Together they are called Eurasia. But for all practical purposes, Europe is treated as a separate continent. In size it is the sixth out of the seven continents of the world, only bigger than Australia.

Africa is next to Asia in size. The Suez Canal separates it from Asia. It is the only continent of the world which has the Tropic of Cancer, the Equator and the Tropic of Capricorn passing through it.

North America is the third largest continent of the world after Asia and Africa. It is about eight times the size of India. It was Columbus who discovered this continent in 1492 A.D.

South America is the fourth largest continent of the world after Asia, Africa and North America. It is more than five times the size of India.

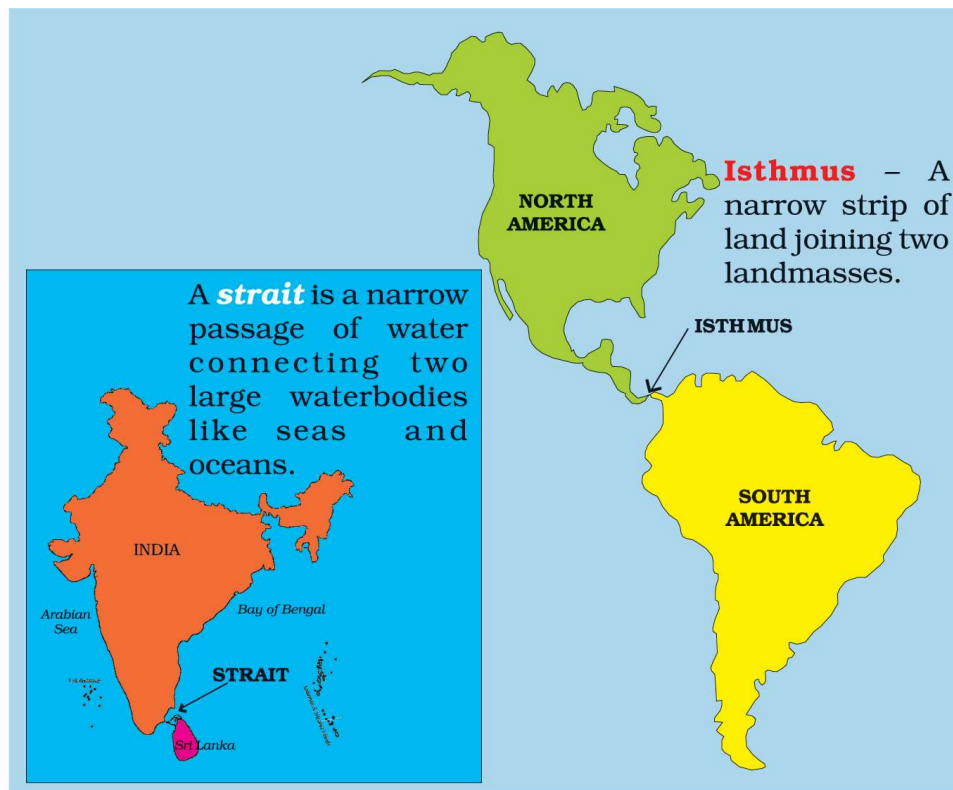
North America and the South America also formed a single landmass before they were separated by the Panama Canal.

Australia is the smallest continent on the earth. It is sometimes called an 'island continent'. It is surrounded on all sides by seas and oceans.

Antarctica is a big continent. It lies around the South Pole. It is always covered with snow and ice, and as such there is no permanent human settlement here. It was first discovered in 1921. Many countries of the world are continuously sending expeditions to Antarctica to gain more knowledge about this new discovery. India is also one of those countries which have been sending expedition after expedition to this continent since 1982.

By looking at the globe you will find that:

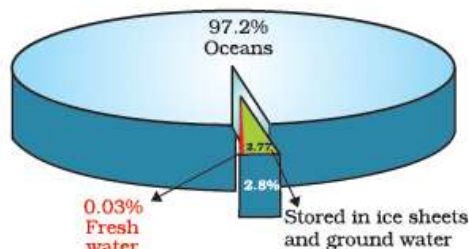
- (i) Three continents - Asia, Europe and North America entirely lie in the Northern Hemisphere.
- (ii) Two continents - Australia and Antarctica entirely lie in the Southern Hemisphere.
- (iii) Africa and South America lie in both the Hemispheres and the equator passes through them.



Isthmus and Strait

HYDROSPHERE

The earth is called the blue planet. More than 71 per cent of the earth is covered with water and 29 per cent is with land. Hydrosphere consists of water in all its forms. As running water in oceans and rivers and in lakes, ice in glaciers, underground water and the water vapour in atmosphere, all comprise the hydrosphere.



More than 97% of the Earth's water is found in the oceans and is too salty for human use. A large proportion of the rest of the water is in the form of icesheets and glaciers or under the ground and a very small percentage is available as fresh water for human use. Hence, despite being a 'blue planet' we face a shortage of water!!



OCEANS

Oceans have got a great importance of their own from many points of view:

- (i) The presence of large quantities of water in the oceans is responsible for moderating the temperature.
- (ii) The ocean currents often keep the hot countries quite cool and cold countries quite warm. In this way, they have a moderating influence on the climate of various countries.
- (iii) The tides keep the sea-shores quite clean.
- (iv) Oceans provide abundant water vapour to the atmosphere which results in rains on the plains.
- (v) Oceans help in maritime activities and promote trade.
- (vi) Oceans provide an abundant source of food for mankind.

Water of Oceans

The waters of the oceans are never still. They are always moving for one reason or the other.

There are different kinds of movements in them. Waves, tides and currents are the three chief movements of the ocean waters.

The rising and falling of the surface water caused by pushing action of the winds, is called a wave.

The regular and alternate rise and fall of water twice a day, caused by the gravitational pull of the moon and sun, are called tides.

Big streams of water flowing regularly, constantly and in definite direction on the surface of the ocean are called ocean currents.

Besides the oceans, there are smaller water bodies such as seas, bays and gulfs. Oceans are vast expanse of salt water covering the greater part of the surface of the earth. Seas are also quite vast but they are smaller in size as compared to oceans and are almost surrounded by land. A gulf is a hollow carved out in the sea-coast which lets the water reach deep inland while a bay is an inlet of the sea with a wider opening than a gulf. You must have read about the Arabian Sea, the Bay of Bengal and the Persian Gulf. Look at your atlas to find out some more such water bodies.

ATMOSPHERE

The earth is surrounded by a layer of gas called the atmosphere. This thin blanket of air is an integral and important aspect of the planet. It provides us with the air we breathe and protects us from the harmful effects of sun's rays.

The atmosphere extends up to a height of about 1,600 kilometres. The atmosphere is divided into five layers based on composition, temperature and other properties. These layers starting from earth's surface are called the troposphere, the stratosphere, the mesosphere, the thermosphere and the exosphere.

The atmosphere is composed mainly of nitrogen and oxygen, which make up about 99 per cent of clean, dry air. Nitrogen 78 per cent, oxygen 21 per cent and other gases like carbondioxide, argon and others comprise 1 per cent by volume. Oxygen is the breath of life while nitrogen helps in the growth of living organisms. Carbon dioxide, though present in minute amount, is important as it absorbs heat radiated by the earth, thereby keeping the planet warm. It is also essential for the growth of plants.

The density of the atmosphere varies with height. It is maximum at the sea level and decreases rapidly as we go up. You know, the climbers experience problems in breathing due to this decrease in the density of air. They have to carry with them oxygen cylinders to be able to breathe at high altitudes. The temperature also decreases as we go upwards. The atmosphere exerts pressure on the earth. This varies from place to place. Some areas experience high pressure and some areas low pressure. Air moves from high pressure to low pressure. Moving air is known as wind.



Layers of the Atmosphere



A mountaineer

IMPORTANCE OF THE ATMOSPHERE

The atmosphere is very important to us. It has many advantages of its own:

1. The atmosphere acts like a blanket or a glasshouse for the earth. It receives the radiation of the sun but does not allow all the insulation to go outside. As such it keeps the earth warm.
2. It protects us from the harmful solar radiation.

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3. The water vapour and carbon dioxide the Biosphere- But remember, it is the ideal state present in the lower layers of the atmosphere of the 'biosphere' that supports all kinds of life. Absorb the heat radiated by the earth's surface and Any disturbance in this ideal state may cause as such they keep the atmosphere warm even during night.
4. Had there been no atmosphere, the extremes of temperature between the day and night would have been much greater.
5. The sun's rays heat the atmosphere differently and they create circulation in the atmosphere which leads to winds and rains.
6. The atmosphere controls the extremes of the season. The different trees and plants adapt themselves easily to the changing season and survive conveniently.

BIOSPHERE – THE DOMAIN OF LIFE

The biosphere is the narrow zone of contact between the land, water and air. It is in this zone that life, that is unique to this planet, exists. There are several species of organisms that vary in size from microbes and bacteria to huge mammals. All the living organisms including humans are linked to each other and to the biosphere for survival.

The organisms in the biosphere may broadly be divided into the plant kingdom and the animal kingdom. The three domains of the earth interact with each other and affect each other in some way or the other. For example, cutting of forests for fulfilling our needs of wood, or clearing land for agriculture may lead to fast removal of soil from slopes. Similarly earth's surface may be changed due to natural calamities like earthquakes. For example, there could be submergence of land, as happened in the case of Tsunami recently. Parts of Andaman & Nicobar islands were submerged under water. Discharge of waste material into lakes and rivers makes the water unsuitable for human use. It also damages other forms of life.

Emission from industries, thermal power plants and vehicles, pollute the air. Carbon dioxide (CO_2) is an important constituent of air. But increase in the amount of CO_2 leads to increase in global temperatures. This is termed as global warming. There is thus, a need to limit the use of resources of the earth to maintain the balance of nature between the domains of the lithosphere, the atmosphere and the hydrosphere.

