

## CHAPTER 5 – MAJOR DOMAINS OF THE EARTH

### Relevance rating: 3/5

- Civil Service syllabus: India and World Geography-Physical Geography
- The concepts of lithosphere, biosphere, and relative location of continents-oceans discussed in the chapter help you in developing basic idea about various physical features on earth.
- This will help in better understanding of various physical phenomenon related to climate and atmosphere which you will read in further classes.
- You might get questions in prelims about terms as Straits, Isthmus; Location based questions on map from this chapter. (Previous Year Prelims Question on pg 5)
- *This chapter should be read along Chapter-6 Major Landforms of the Earth for better understanding and concept clarity.*

### Chapter Overview:

This chapter deals with

- Various domains of the Earth and their composition- Atmosphere, Hydrosphere, Lithosphere, Biosphere.
- Area and positioning of various Continents and Oceans
- Terms like Straits, Isthmus

*Note: This summary should be supplemented with basic reading of NCERT.*

Our earth is the only planet which has life. Human beings can live here because the life sustaining elements of land, water and air are present on the earth.

Following discussion will take us to the details of what all makes Earth Unique.

### ❖ **VARIOUS DOMAINS OF THE EARTH**

- **Lithosphere**- the solid portion
- **Atmosphere**-gaseous layer that surrounds earth
- **Hydrosphere**-water covered area
- **Biosphere**-narrow zone containing all the above three

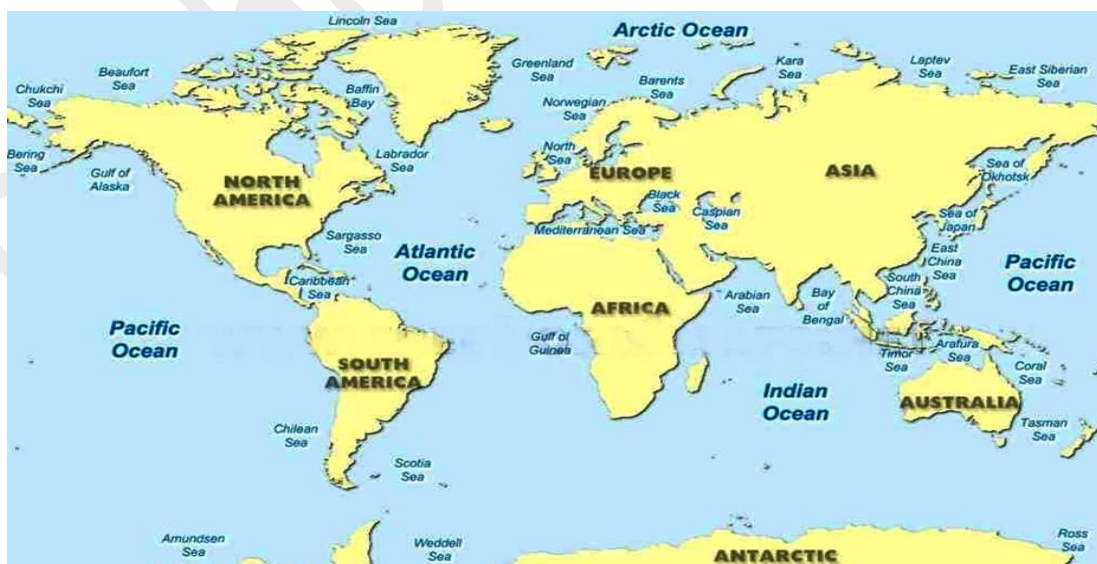
We will be discussing all the above domains and their components in detail.

#### **1. 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, unlike landmasses.  
*\*\*What connects landmasses...?? We will get to know in further discussion\*\**
- 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 surface of lithosphere is highly uneven. The **highest mountain** (highest point on lithosphere) peak **Mt. Everest is 8,848 metres** above the sea level. The **greatest depth** (deepest point on lithosphere) of **11,022 metres is recorded at Mariana Trench** in the Pacific Ocean.

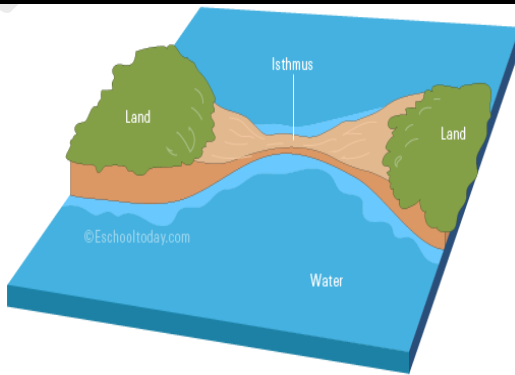
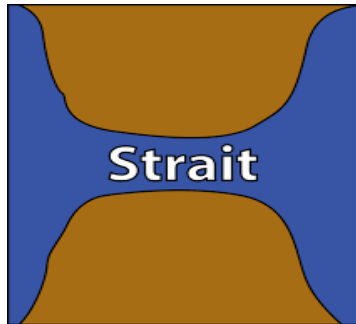
### ❖ COMPONENTS OF LITHOSPHERE

1. **CONTINENTS** - There are seven major continents. These are separated by large water bodies. These continents are – Asia, Europe, Africa, North America, South America, Australia and Antarctica.
  - **Asia** is the largest continent. It covers about one- third of the total land area of the earth. The continent lies in the Eastern Hemisphere. The Tropic of Cancer passes through this continent. Asia is separated from Europe by the Ural Mountains on the west). The combined landmass of Europe and Asia is called the **Eurasia (Europe+Asia)**.
  - **Africa** is the second largest continent after Asia. The Equator or 0 degree latitude runs almost through the middle of the continent. A large part of Africa lies in the Northern Hemisphere. **It is the only continent through which the Tropic of Cancer, the Equator and the Tropic of Capricorn pass.** The **Sahara Desert**, the world's largest hot desert, is located in Africa. The continent is bound on all sides by oceans and seas.
  - **North America** is the third largest continent of the world. It is linked to South America by a very narrow strip of land called the **Isthmus of Panama**. The continent lies completely in the Northern and Western Hemisphere. Three oceans surround this continent.
  - **Europe** is much smaller than Asia. The continent lies to the west of Asia. **The Arctic Circle passes through it.** It is bound by water bodies on three sides.
  - **South America** lies mostly in the Southern Hemisphere. The **Andes, world's longest mountain range**, runs through its length from north to south. South America also has the **world's largest river, the Amazon.**
  - **Australia** is the **smallest continent** that lies entirely in the Southern Hemisphere. It is surrounded on all sides by the oceans and seas. It is called an *island continent*.
  - **Antarctica**, completely in the Southern Hemisphere, is a huge continent. The South Pole lies almost at the center of this continent. As it is located in the South Polar Region, it is permanently covered with thick ice sheets. There are no permanent human settlements. Many countries have research stations in Antarctica. India also has research stations there. These are named as **Maitri** and **Dakshin Gangotri**.



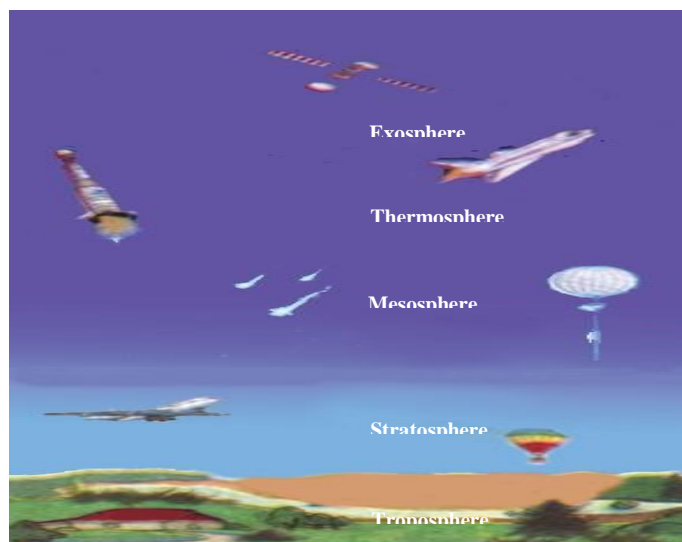
## 2. HYDROSPHERE

- 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 ice sheets and glaciers or under the ground and a very small percentage is available as fresh water for human. Thus need for conservation of this precious resource.
- Oceans are the major part of hydrosphere. They are all interconnected.
- The ocean waters are always moving. The **three chief movements of ocean waters are the waves, the tides and the ocean currents**.  
(We will read about these in detail in further classes) *(These concepts are important from both prelims and mains point of view)*
- The **five major oceans are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean and the Arctic Ocean, in order of their size**.
- The **Pacific Ocean is the largest ocean**. It is spread over one-third of the earth. Mariana Trench, the deepest part of the earth, lies in the Pacific Ocean. The Pacific Ocean is almost circular in shape. Asia, Australia, North and South Americas surround it. Look at the map and find out the location of the continents around the Pacific Ocean
- The **Atlantic Ocean is the second largest Ocean in the world**. It is 'S' shaped. It is flanked by the North and South Americas on the western side, and Europe and Africa on the eastern side. The coastline of Atlantic Ocean is highly indented. This irregular and indented coastline provides ideal location for natural harbours and ports. From the point of view of commerce, it is the busiest Ocean.
- The **Indian Ocean is the only ocean named after a country, that is, India**. The shape of ocean is almost triangular. In the north, it is bound by Asia, in the west by Africa and in the east by Australia.
- The **Southern Ocean encircles the continent of Antarctica** and extends northward to 60 degrees south latitude.
- The **Arctic Ocean** is located within the Arctic Circle and surrounds the North Pole. It is connected with the Pacific Ocean by a narrow stretch of shallow water known as Bering strait. It is bound by northern coasts of North America and Eurasia.

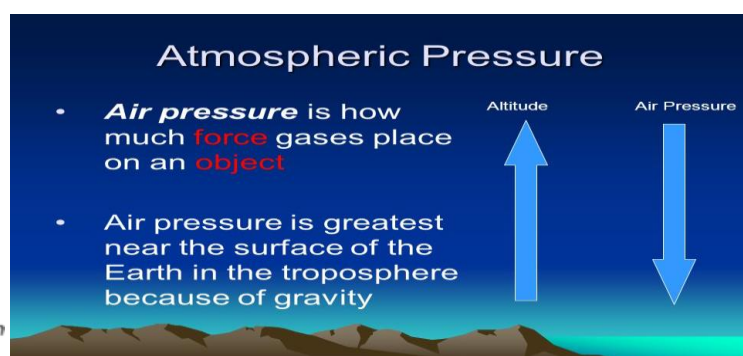
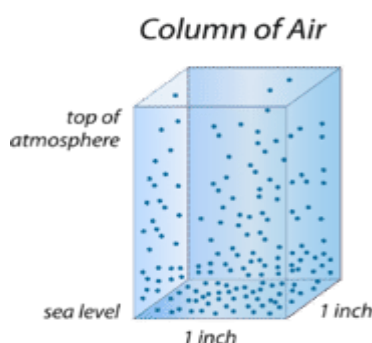
ISTHMUS	STRAIT
It is a narrow strip of land with sea on either side, forming a link between two larger areas of land.	A narrow passage of water connecting two seas or two other large areas of water. Ex- Strait of Gibraltar, Strait of Malacca etc.
	

### 3. ATMOSPHERE (This topic is very important from Prelims point of view)

- 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 is 78 per cent**-which is important for various life processes
- Oxygen is 21 per cent** - Oxygen is the breath of life while nitrogen helps in the growth of living organisms
- Carbon dioxide, argon and others comprise 1 per cent by volume.** 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. This is why the climbers experience problems in breathing due to the 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. This **moving air is known as wind**.





### PREVIOUS YEAR PRELIMS QUESTION ON THIS TOPIC (2011)

**Q.** A layer in the Earth's atmosphere called Ionosphere facilitates radio communication. Why?

1. The presence of ozone causes the reflection of radio waves to Earth.
2. Radio waves have a very long wavelength.

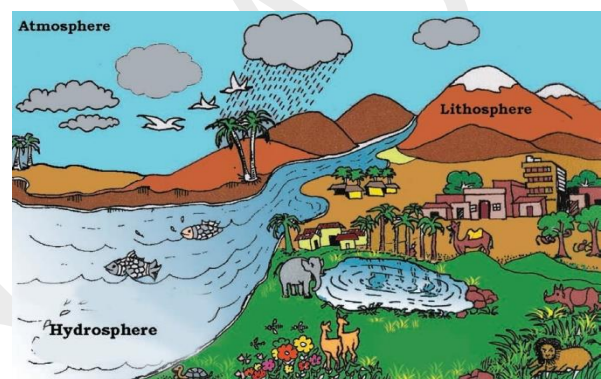
Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

**Solution:** (d)

#### 4. BIOSPHERE

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. The biosphere, also known as the ecosphere, is the worldwide sum of all ecosystems. It can also be termed the zone of life on Earth, a closed system, and largely self-regulating.



#### Key Takeaways:

- Various domain of the earth-Lithosphere, Hydrosphere, Atmosphere, Biosphere.
- Components of lithosphere-Continents and Oceans.
- **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.
- Five major oceans are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean and the Arctic Ocean, in order of their size.
- **Isthmus**- It is a narrow strip of land with sea on either side, forming a link between two larger areas of land.
- **Strait**- a narrow passage of water connecting two seas or two other large areas.
- The earth is surrounded by a layer of gas called the atmosphere
- 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.
- Atmospheric layers starting from earth's surface are called the troposphere, the stratosphere, the mesosphere, the thermosphere and the exosphere.
- Composition of atmosphere-Nitrogen is 78 per cent, Oxygen is 21 per cent, Carbon dioxide, argon and others comprise 1 per cent by volume.
- Density of the atmosphere varies with height.
- The biosphere is the narrow zone of contact between the land, water and air.
- Biosphere is also known as Ecosphere.