

# MAJOR DOMAINS OF THE EARTH

Atmosphere

Biosphere

## Module 2

Lithosphere

Hydrosphere

# 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 use.
- Hence, despite being a 'blue planet' we face a shortage of water!!

# Oceans

- Oceans are the major part of hydrosphere. They are all inter connected.
- The ocean waters are always moving. The three chief movements of ocean waters are the waves, the tides and the ocean currents.
- 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.

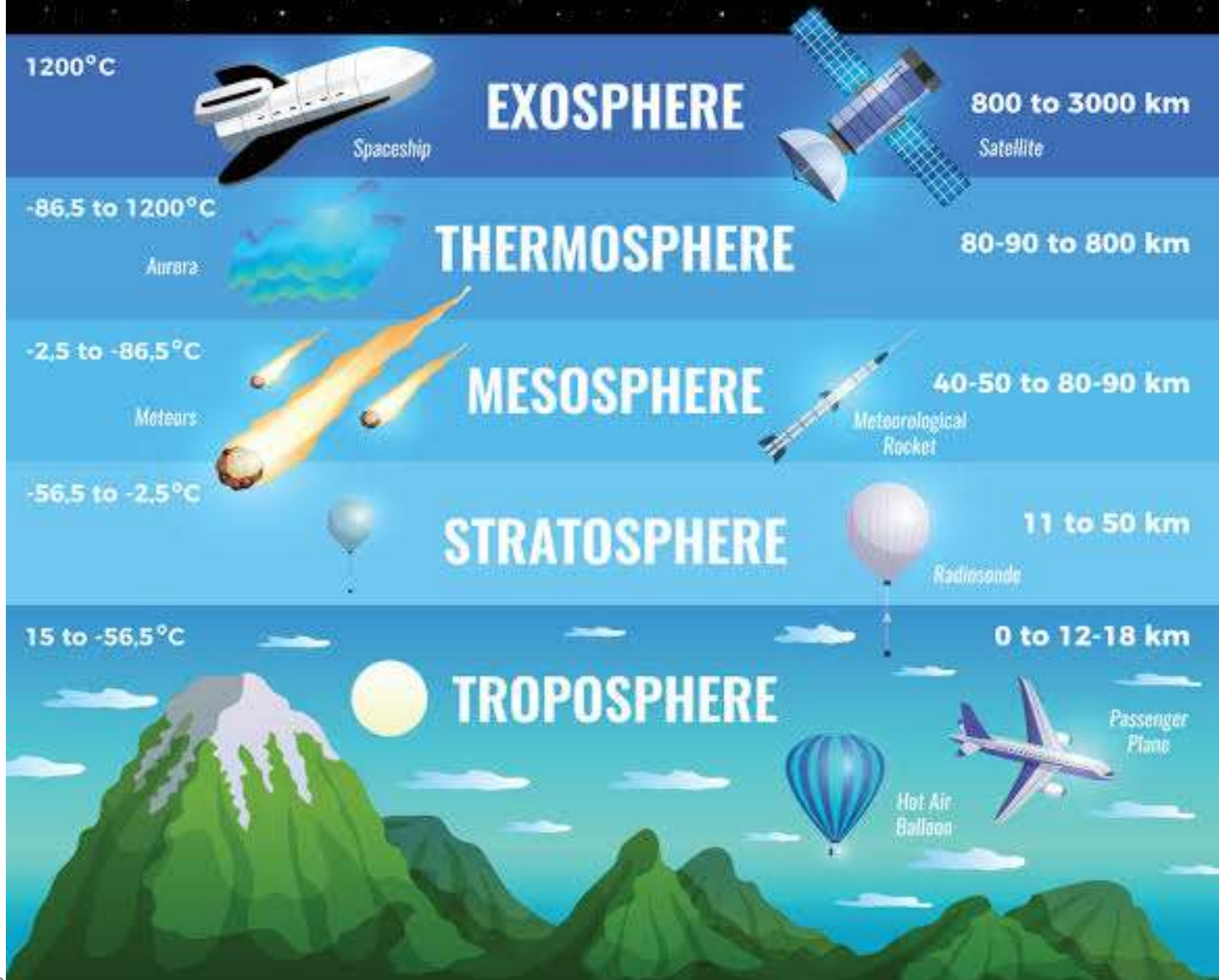
- The Pacific Ocean is almost circular in shape. Asia, Australia, North and South Americas surround it.
- The Atlantic Ocean is the second largest Ocean in the world.
- It is 'S' shaped. It is flanked by the North and South Americas on the western side, and Europe and Africa on the eastern side.
- The 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.

# 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.

# Layers of Earth's Atmosphere





- 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 carbon dioxide, 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.
- 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.

# 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<sub>2</sub>) is an important constituent of air

- But increase in the amount of CO<sub>2</sub> 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.

**Thank you ...**