

BOYS' HIGH SCHOOL AND COLLEGE, PRAYAGRAJ
CLASS PERFORMANCE TEST – 1 (2020-2021)
SOCIAL STUDIES WORKSHEET
CLASS – IV
LESSON -5
THE FOUR DOMAINS OF THE EARTH

- **Parents are requested to ensure that the child reads and understands the chapter and the related exercises**



The Four Domains of the Earth

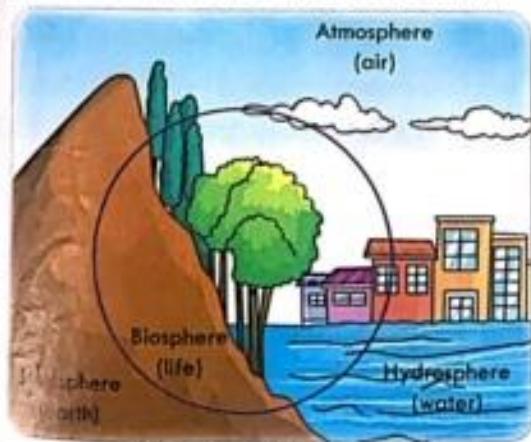


Learning Objectives :

- Lithosphere
- Atmosphere
- Hydrosphere
- Biosphere

Four Realms of the earth, also known as four spheres of life that interact with each other, are the **Atmosphere**, the **Biosphere**, the **Lithosphere** and the **Hydrosphere**. Lithosphere provides the surface of the earth and the ocean floors, Hydrosphere provides water in all forms and the Atmosphere provides air. All these three realms of the earth together support life and allow life to flourish.

for what they are made-up of : 'atmo' for 'air' ; 'bio' for 'life' ; 'Litho' for 'rocky' ; 'hydro' for 'water'.



Domains of the Earth

The names of each of these spheres have been derived from Greek words

THE ATMOSPHERE

Atmosphere is a blanket of gases surrounding the earth and held in place by the earth's gravitational pull. The atmosphere extends up to approximately 1600 km above the surface of the earth. However, density of the atmosphere is not uniform everywhere. It varies with height. It is very dense near the surface of the earth as most of the gases are concentrated in the lower 32 km only. As we go up, the atmosphere thins considerably until it gradually merges with space. This atmosphere is extremely important for life to exist on earth and protects it.

The air in the atmosphere consists of nitrogen (78.1%), oxygen (20.9%) and argon (0.9%). Traces of several other gases like carbon dioxide, carbon

monoxide, nitrous oxide, hydrogen, helium, neon, ozone and methane etc. are also present in the atmospheric air.

Importance of Atmosphere

- It contains life supporting gases such as oxygen, nitrogen and carbon dioxide.
- It prevents the harmful ultraviolet rays of the sun from reaching us.
- It acts as a blanket by trapping the solar radiations and keeping the earth warm.

VARIOUS LAYERS OF EARTH'S ATMOSPHERE



Layers of the Atmosphere

Thermosphere	50–120 Miles
Mesosphere	30–50 Miles
Stratosphere	8–30 Miles
Troposphere	0–8 Miles

The earth's atmosphere is divided into five layers on the basis of changes in the temperature with height.

Troposphere

It is the first layer above the surface stretching from 8 km-18 km. This layer is most important because this is where we live. It contains the air we breathe. All human activities as well as the weather changes such as formation of clouds, rainfall etc. take place in this layer.

Stratosphere

It lies above the troposphere extending upto a height of 50 km above the surface of the earth. The ozone gas in this layer protects us from the harmful rays of the sun. Many jet aircrafts fly in the stratosphere because it is very stable.

Mesosphere

It lies above the stratosphere extending upto a height of 50-80 km above the surface of the earth. It is the coldest part of Earth's atmosphere at -90°C . Meteors burn up in the mesosphere.

Thermosphere

It stretches from 80-500 km above the surface of the earth. It is extremely hot in the thermosphere and it gets warmer as you go higher. The air gets thinner. This layer contains electrically charged particles at the lower level. This layer known as ionosphere transmits radiowaves back to the earth. It is the layer where the space shuttle orbits.



Exosphere

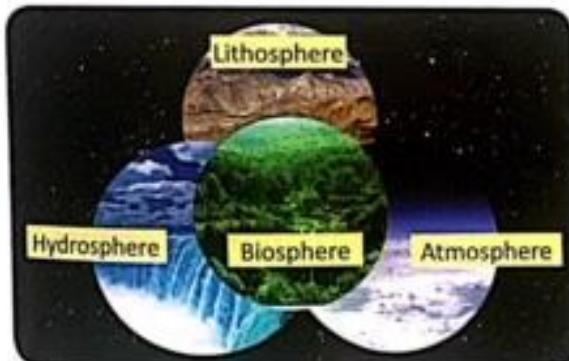
It is the topmost layer or the upper most limit of the atmosphere. It extends from 500-10000 km. The atmosphere merges into space in the extremely thin exosphere. It contains light gases like hydrogen and helium. It is extremely hot in this layer.



Atmospheric pressure is the weight of air over us. We may not feel it, but all the time, there is an atmospheric pressure.

BIOSPHERE

Biosphere is that narrow zone where land, water and air come in contact with each other. Biosphere makes the earth a unique planet as life exists only in biosphere.



It is that part of the Earth where all living beings exist and it is that part of the Earth where Lithosphere, Hydrosphere and Atmosphere co-exist.

Earth has countless species of plants and animals living in the biosphere. Different

varieties of plants and animals live in different parts of the earth depending upon the conditions in that part of biosphere. The biosphere has distinct zones or ecosystems having their own climate, animals and plants. In every ecosystem, there is a very delicate balance between the physical environment (i.e., the land, water and air) and the biological environment (all the living beings). They are both interdependent. If physical environment changes, it will also change the animal and plant life.

For example, plants growing in deserts are different from plants growing in plains because of soil conditions and availability of water.



Plants that grow in deserts



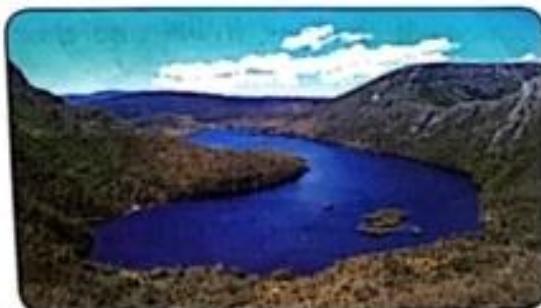
Plants that grow in the plains

The animals and birds in various parts of the world are different from each other because of the climatic conditions. Aquatic life that exists in the river water and lakes is different from that in oceans and seas because of different conditions. A camel cannot survive in Polar Regions and a polar bear cannot survive in a desert. Thus, a combination of soil conditions, water availability and atmospheric conditions



like temperature decide the kind of life that can survive in any part of our planet.

LITHOSPHERE



Lithosphere is the solid outer layer or section of the Earth including crust and outermost mantle. It includes the outer part of the Earth like continents and ocean floors. In fact this is where we all live on Earth. It is about 100 km deep from the surface of the Earth.

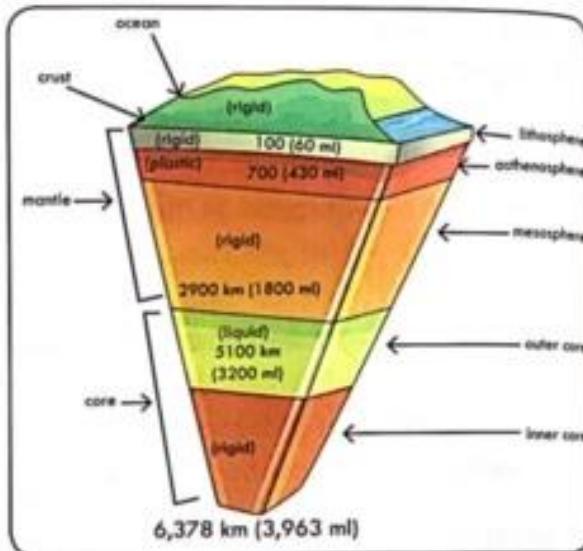


Do You Know?

Most of the planet's life is found from 3 metres below the ground to 30 metres above it and in the top 200 metres of the oceans and seas.

The outermost layer that is called the earth's crust varies in thickness.

The **Oceanic crust** under the oceans is about 5–10 km thick.



The **Continental crust** is about 35 km under the continents and up to 60 km under some mountain ranges.

The Lithosphere includes several landforms such as plains, mountains, valleys, plateaus and ocean floors. This variety of landforms is extremely important for our planet as it gives a variety of climatic conditions, supports different types of plants and animals and gives a variety of occupations to our people. For example, the plains are extremely suitable for agriculture, whereas mountains experiencing heavy snowfalls provide us with water through rivers.

Continents

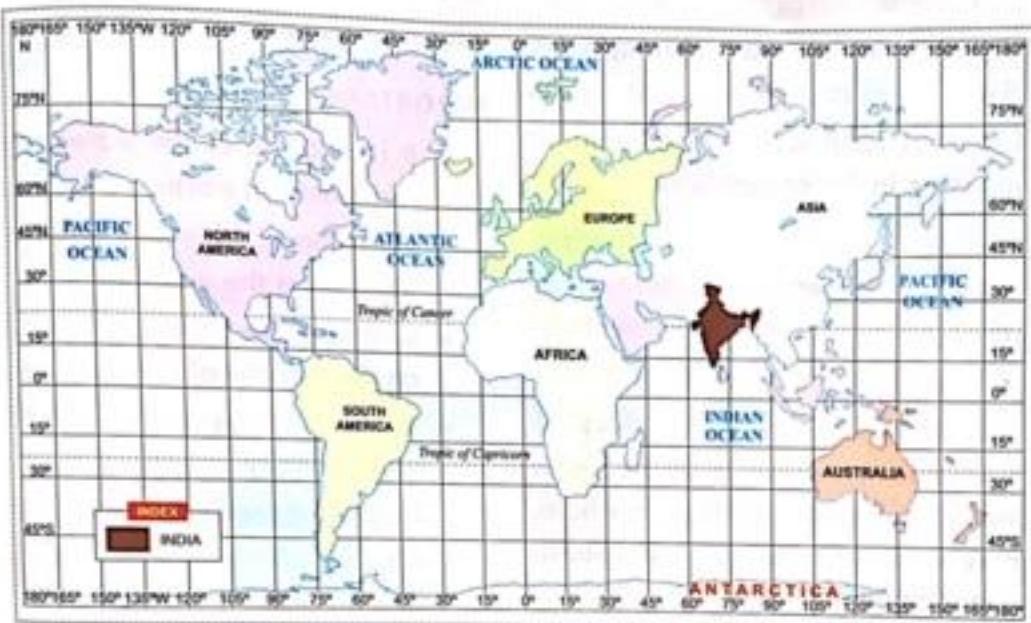
Continents are large land masses separated by expanses of water. Seven regions recognised as continents are Asia,



Africa, North America, South America, Antarctica, Europe and Australia. However, many of the seven continents are not landmasses separated by water. Areawise, the continents are concentrated more in the Northern Hemisphere than in the Southern Hemisphere.

Seven continents of the Earth are as follows :

1. Asia
2. North America
3. South America
4. Africa
5. Europe
6. Australia
7. Antarctica



Importance of Lithosphere

1. Lithosphere provides the surface on which human beings and animals live and plants are grown.
2. It provides the soil cover.
3. By supporting the growth of plants, it provides food for human beings and animals.
4. It is a source of minerals.
5. It is a source of fossil fuels which serve our energy needs.



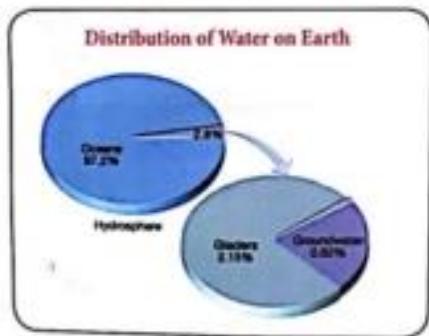
HYDROSPHERE

The **hydrosphere** is the world of water that surrounds all of us. Anything related to water is a part of the hydrosphere. It includes all the water on the earth in any form :

- Solid form, such as snow and glaciers.
- Liquid form such as oceans, seas, rivers, lakes and underground water.
- Gaseous form such as vapours and moisture in the atmosphere.

Hydrology is the study of water. Hydrologists study water and the way it is used and circulated across the planet, from the bottom of the oceans to the clouds.

All life depends on water - from the tiniest bacteria to the largest elephant or whale. Liquid water makes the earth a special



place. The temperature range on the earth is just right to allow water to remain in a liquid form. If earth had temperature like Pluto (not a planet now), water would have permanently turned into ice; if the temperature here was like Mercury, water

would have evaporated and turned into a gaseous form.

97 % of the total water on the Earth is found in oceans and seas.

The Southern Hemisphere has more water and less land. Most of the oceans and seas are in the Southern Hemisphere. That is why, it is also called **Water Hemisphere**.

IMPORTANCE OF HYDROSPHERE

- It is because of the water cycle that life exists on earth.
- The amount of water vapour in the air affects the weather.
- Oceans have a moderating influence on the climate of coastal areas.
- Water is required for irrigation and various daily needs.
- Helps in generating electricity.
- Marine life in oceans provides a source of livelihood.

PROTECTION OF FOUR REALMS OF EARTH

Due to the pressure of rapidly growing population and ever increasing demands of human beings, natural resources are being recklessly exploited.

Human beings are cutting down forests for agriculture, industry and for making houses. Minerals like coal, petroleum and metals are being extracted recklessly.

Excessive use of insecticides and pesticides are polluting our land.



Pollution caused by various industries and vehicles is polluting the air, water and land on our earth.

Due to these factors, a large number of birds and animals are becoming extinct or their number is depleting.

It is also giving rise to the problem of global warming. Another dangerous effect of global warming is the increase in the melting of polar ice. This might lead to the drowning of low-lying islands and coastal areas.

Thus, it is only by maintaining the natural balance between the different realms that we can protect our planet Earth.

Global warming

Carbon dioxide traps the heat radiated from the earth's surface like a blanket and causes increase in the temperature of the earth. This is called greenhouse effect.

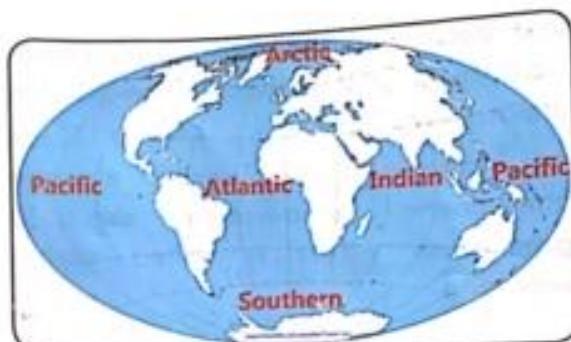
Oceans

Oceans are very large water bodies separated by continents. There are five oceans on the Earth. The five oceans are Pacific Ocean, Atlantic Ocean, Indian Ocean, Southern Ocean (Antarctic) and the Arctic Ocean. Till the year 2000, only four oceans were recognized. Recognized in the year 2000, Southern Ocean is the latest Ocean.



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In fact, there is only one global ocean, as all the oceans are interconnected. That is why, the level of sea water remains the same throughout the world. The boundaries of these five oceans have been drawn because of the various geographical, historical and scientific considerations.

In addition to these major oceans, there are branches of oceans called seas. The largest seas are South China Sea, the Caribbean Sea and the Mediterranean Sea.

The following are the five oceans :

1. Pacific Ocean
2. Atlantic Ocean
3. Indian Ocean
4. Arctic Ocean
5. Antarctic Ocean

Pacific Ocean is the largest ocean.

Rise in carbon dioxide in the atmosphere due to emissions caused by industry and vehicles have resulted in the rise in global temperatures leading to climatic changes. Cutting down the trees

and destroying the forests also causes increase in carbon dioxide levels in the atmosphere.

An increase in the earth's average atmospheric temperature due to greenhouse effect is called **global warming**.

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Global warming causes the sea levels to rise and when the sea level rises, the water covers many low land islands causing serious consequences for the people living in coastal areas. It also causes serious changes in the climatic conditions, brings about droughts and floods and disturbs the ecosystem.

WORKSHEET :

➤ Answer the following questions :

- I. Mention the four realms of the earth.
- The four realms of the earth are :
 1. Atmosphere
 2. Biosphere
 3. Lithosphere
 4. Hydrosphere
- II. Define atmosphere and its importance.
- Atmosphere is a blanket of gases surrounding the earth and held in place by the earth's gravitational pull. The importance of atmosphere are :
 1. It contains life supporting gases.
 2. It prevents the ultraviolet rays of the sun from reaching us.
 3. It acts as a blanket by trapping the solar radiations.
- III. Name the various layers of atmosphere.
- The various layers of atmosphere are :
 1. Troposphere
 2. Stratosphere
 3. Mesosphere
 4. Thermosphere
 5. Exosphere
- IV. What do you mean by biosphere ?
- Biosphere is that narrow zone where land, water and air come in contact with each other. It is that part of earth where life exists.
- V. Differentiate between lithosphere and hydrosphere.(2 points each)
- LITHOSPHERE
 1. It is the solid outer layer or section of the earth.
- HYDROSPHERE
 - It is the world of water that surrounds all of us.

2. It includes the continents and ocean floors.
- It includes all the water on the earth.
- VI. Explain the following terms:(i) oceans (ii) continents (iii) global warming
- OCEANS-Oceans are very large water bodies separated by the continents.They are five oceans on the earth.They are PACIFIC OCEAN,ATLANTIC OCEAN,INDIAN OCEAN,SOUTHERN OCEAN and the ARCTIC OCEAN.
 - CONTINENTS-Continents are large land masses separated by expanses of water.There are seven continents on the earth.They are ASIA,AFRICA,NORTH AMERICA,SOUTH AMERICA,ANTARCTICA,EUROPE and AUSTRALIA.

➤ **FILL IN THE BLANKS :**

- I. Atmosphere contains life supporting gases.
- II. Atmosphere acts as a blanket by trapping solar radiations
- III. Many aircrafts fly in the stratosphere because of its stability.
- IV. The topmost layer of the atmosphere exosphere.
- V. Mesosphere is the coldest part of earth's atmosphere.
- VI. Hydrology is the study of water.
- VII. Another name for SOUTHERN HEMISPHERE water hemisphere.

➤ **MATCH THE FOLLOWING :**

COLUMN (A)	COLUMN (B)
❖ Causes increase in the temperature of the earth	hyroshphere
❖ Meteors burn up in	thermosphere
❖ Layer where space shuttle orbits	greenhouse effect
❖ Source of minerals	mesosphere
❖ Helps in generating electricity	ionosphere

➤ **STATE TRUE OR FALSE :**

- I. The outermost layer that is called earth's crust varies in thickness
- II. One of the largest sea is South China Sea
- III. The oceanic crust under the oceans is about 20-25 km thick.....
- IV. Due to pollution large number of birds and animals are becoming extinct
- V. Helium gas is present in exosphere.....

➤ **DRAW ,LABEL AND COLOUR :**

- Domains of the Earth (Pg-35)

❖ **NOTE:(All the questions and exercises to be one in the new SOCIAL STUDIES INTERLEAF notebook which will be checked once the school re-opens)**

❖ **GUIDELINES TO BE FOLLOWED :**

- Write the lesson name on a fresh page along with the date.
- Neatly draw ,colour and label the diagram on the blank side (left)of the notebook.
- Draw finishing line after every exercises and answers.
- Learn all the answers.