Tender Heart High School

Sector 33 B, Chandigarh

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Class: IX

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Subject: Geography

Chapter 1

Earth as a Planet

Good Morning Student

This is the lesson of Class IX Geography, In this lesson we will study about Earth as a unique planet, Realms of Earth, Shape of Earth, Size of Earth, Proofs of Earth's Shape, Geocentric Theory, Heliocentric Theory, Measurement of Earth by Eratosthenes and Conditions making life possible on Earth.

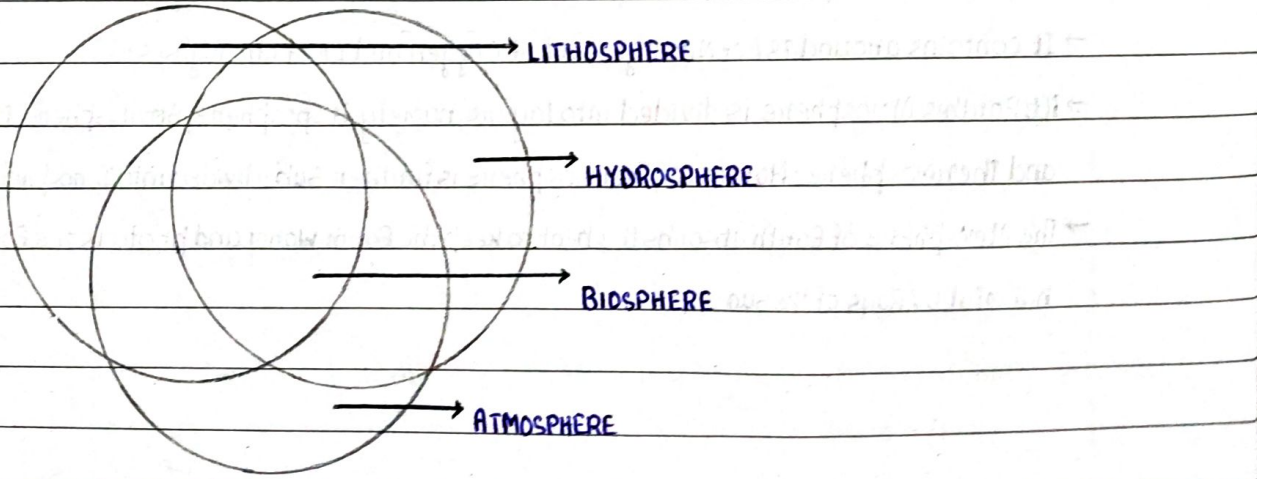
1) Earth as a Unique Planet:

→ The Earth is a unique planet because it is the only planet that supports life due to presence of Lithosphere, Hydrosphere and Atmosphere.

→ These three spheres interacts in a narrow zone known as Biosphere.

→ Thus, Biosphere makes life possible on our Earth.

2) Realms or Spheres of Earth:



(a) Lithosphere:

→ The sphere of land is known as lithosphere.
→ It is actually the solid crust of Rocks present on Earth's surface on which we live.
→ Lithosphere consists of crust and upper portion of Mantle.
→ In Lithosphere, the crust mainly consists of Igneous Rocks and the rest portion of Lithosphere has Sedimentary and Metamorphic Rocks.
→ Lithosphere is also the home of many organisms.

(b) Hydrosphere:

→ The sphere of water is known as Hydrosphere.
→ our Earth is the only planet in our solar system that has abundant of water on its surface which is essential for existence of Life.
→ water present in oceans moderates the temperature of Earth and also helps in process of Water Cycle.
→ water present in oceans are also the main source of Minerals and Trade.

(c) Atmosphere:

→ The sphere of Air is known as Atmosphere.
→ Atmosphere is the envelope of Air that surrounds the Earth.
→ In this sphere there is horizontal movement of air, known as wind.
→ The Earth's Atmosphere extends upto 1600 kilometres
→ It contains around 78% of Nitrogen, 21% of Oxygen and 1% of other gases.
→ The Earth's Atmosphere is divided into layers, namely Troposphere, Stratosphere, Mesosphere and Thermosphere. Moreover, Thermosphere is further sub-divided into Ionosphere and Exosphere.
→ The Atmosphere of Earth absorbs the heat to keep the Earth warm and protects the Earth from harmful UV Rays of the Sun.

(d) Biosphere:

→ Biosphere is the thin layer where all other three realms of Earth meet.
→ This layer provides favourable conditions for life to exist.
→ In Biosphere, Sun is the ultimate source of Heat, Light and Energy for all living beings.
→ Moreover, In Biosphere, Energy flows from one trophic level to another through a food chain and this flow of Energy is the basis of life in Biosphere.

3) Shape of the Earth:

→ In Ancient times, people thought that the Shape of the Earth was like a flat disc and feared to travel far into the sea.
→ This was because they thought that if they will reach the edge of the disc, they might slip down the ocean.
→ But in the year 1519-1522, Ferdinand Magellan along with his crew circumnavigated the Earth. It proved that the earth was spherical in shape.
→ In present age, the shape of the Earth is considered as Geoid. Say, Slightly bulged at the Equator and slightly compressed at Poles.
→ This shape of the Earth is due to Centrifugal Force that is created due to rotation of Earth.

4) Size of Earth:

→ Equatorial Diameter - 12756 kms
→ Polar Diameter - 12714 kms
→ Equatorial Circumference - 40075 kms
→ Polar Circumference - 40009 kms
→ Total Surface Area - 510 million km^2
→ Volume - 10.8×10^{20} million km^3
→ Mass - 5.98×10^{21} metric ton
→ Density - 5.52 g/cm^3

5) Proof of Earths Shape:

(a) Shape of Celestial Bodies:

In our Solar system all Celestial Bodies are spherical in shape. Since Earth is also the part of our Solar System, so we can say that Earth is also spherical in shape.

(b) Horizon of Earth:

Whenever we view the earth from a high platform, the horizon of the Earth appears to be circular in shape which proves that the Earth is spherical.

(c) Circumnavigation of the Earth:

In the year 1519-1522, Ferdinand Magellan along with his crew circumnavigated the Earth. It proved that the Earth is spherical in shape.

(d) Time of Sunrise and Sunset:

The time of Sunrise and Sunset is observed at different times in different places of the world. This is because the earth is sphere. If the earth would have been flat, then all the places on the Earth's surface would have experienced Sunrise and Sunset at same time.

(e) Lunar Eclipse:

During Lunar Eclipse we can see that the Earth casts its spherical shadows on the surface of the moon. This directly proves that the Earth is spherical in shape.

(f) Aerial Photography:

The Aerial Photographs sent by Artificial Satellites clearly shows the curvature of the Earth. This proves that earth is spherical in shape.

Let's Recap

Q1) Name the narrow zone where Lithosphere, Hydrosphere and Atmosphere interacts.

Q2) What is the main Rock composition of Lithosphere?

Q3) Water present in oceans helps in which process.

Q4) What is the extent of Earth's Atmosphere?

Q5) Give one importance of Earth's Atmosphere.

Q6) What is the ultimate source of Heat, light and energy for all living beings in biosphere?

Q7) Who circumnavigated the Earth from 1519-1522?

Q8) What is the shape of the Earth?

Q9) Which force is responsible for Geoid shape of Earth?

Now, Students you may pause the lesson for some time and try to find out the answers of these questions. After some time, students lets discuss the answers of the above questions.

Ans 1) Biosphere

Ans 2) Igneous Rocks

Ans 3) Water cycle

Ans 4) 1600 kms

Ans 5) It protect Earth from harmful UV Rays of Sun.

Ans 6) Sun

Ans 7) Ferdinand Magellan

Ans 8) Geoid

Ans 9) Centrifugal Force.

6) Geocentric Theory:

→ Ptolemy believed that the earth was centre of Universe and all other heavenly bodies revolve around the Earth.

→ This view of Ptolemy is known as Geocentric Theory.

→ Thus, Geocentric Theory was proved wrong by copernicus after he propounded his Heliocentric Theory.

7) Heliocentric Theory:

→ In the year 1543, Copernicus published his famous book named 'on the Revolution of the Heavenly Bodies'.
→ In this book he stated that the Earth is round and rotates on its axis and revolves around the Sun.
→ This meant that the Sun is the centre of the Solar System and all other heavenly bodies revolves around it. This view of Copernicus is known as Heliocentric Theory.

8) Measurement of Earth by Eratosthenes:

→ The First attempt to measure the size of Earth was made by Eratosthenes in 3rd century BC.
→ He calculated the size of the Earth by comparing the Angle of Sun's rays at syene in Ashwan and at Alexandria in Egypt
→ Thus, the size calculated by Eratosthenes was 25000 miles, which was nearly close to 24860 Miles.

9) Conditions making life possible on Earth:

(a) The distance of Earth from the Sun is just right, so it receives perfect amount of heat that is required to sustain Life.
(b) water present on earth also helps to sustain life as it is used for drinking, household purpose, Industries, Agriculture etc.
(c) Atmosphere present on Earth provides oxygen for Human Beings and Carbon dioxide and Nitrogen for plant and it traps the heat and keeps the Earth Warm. Moreover, Atmosphere protects the Earth from harmful UV Rays.
(d) Land present on Earth is the source of minerals and it is the home of many organisms. Moreover the soil layer present in Lithosphere is essential for the growth of plants.

Now Students Let's revise the topic by means of quick retest. I will again read out the questions which you all will try to find.

Q1) who propounded Geocentric Theory?
Q2) who propounded Heliocentric Theory?
Q3) Name the book written by copernicus.

Q4) Who was the first person to measure the size of the Earth?

Thus, often sometime the answers were discussed in the class. It is mentioned below:

Ans 1) Ptolemy

Ans 2) Copernicus

Ans 3) On the Revolution of the Heavenly Bodies

Ans 4) Eratosthenes

I hope you all have understood the topic very well. So you all are required to read chapter 1 and also the questions and answers of Back exercise of chapter 1.

With this I conclude the interactive session.