1. OUR EARTH

All living beings found in this world like plants, animals, human beings etc live on earth. There are land, desert, mountains, rivers, lakes and oceans on this earth. These fulfill all the needs of the living beings.

1.1 Structure of the Earth

What is the shape of the Earth, round or flat?

We can see a very small part of the earth at a time, what we see appears to be flat. To see the whole earth we have to travel beyond the atmosphere of the Earth and go into space. You must have heard that many countries send people into space via rockets. They are called astronauts. Astronauts take pictures of the Earth from space and that shows that the shape of the earth is round (figure 1.1).



Figure 1.1 View of The Earth from space.

Whether the earth is hollow or solid?

You know the Earth is round like a ball? Scientists have found out that earth is not hollow but it is solid. But its surface is not smooth and even. It has high mountains at some places and deep valleys at others. Imagine if the earth is cut, in to two halves how will its structure look like? See that in figure 1.2



Figure 1.2 Inner structure of the Earth.

The Inner structure of the earth has been divided into three main parts (Figure 1.2)

- (1) Crust
- (2) Mantle
- (3) Core

(1) **Crust-** The outer most layer of the Earth where oceans and islands are located is called the crust. All the essential things, which are needed for living beings to live like air, water, food, soil and minerals are found in this crust.

Remains of dead and decaying plants and animals are also found in this layer, these make it fertile. Various minerals like iron, aluminum, copper, coal, limestone, petroleum, natural gases etc which fulfill our needs are all found in this layer.

(2) Mantle- Below the crust there is a thick layer of hot molten rock, which is called mantle. This is the middle layer of the Earth. It has molten rocks along with many gases.

(3) Core- The innermost region of the earth is called its core. It is the hottest part of the earth. It consists of mainly iron and nickel. The core is believed to exist in a solid form. The outer region of the core contains mostly iron in a molten form.

ANSWER THESE

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- (1) Name the three layers of the earth.
- (2) Name the various minerals found in the earth's crust.
- (3) What is mantle?
- (4) Name the metals found in the core of the earth.

1.2 Regions of Earth

See the globe and map of the Earth. In the major part of Earth you will see blue colour. See the upper portion (North pole) and lower portion (South pole) of the globe.

They appear to be white in colour. White colour shows that it is the part of the earth, which is always covered with ice. Do you know that ice is frozen water? On the earth, water is found in liquid form in seas, lakes and rivers and at the poles it is found in solid form. This area which is made up of liquid and solid water is called the Hydrosphere of the earth.

Now see the map or globe again.

Besides the blue and white region, the rest of the earth surface is shown in yellow, brown and green colours. This is the region that we call land. On this land surface there are mountains, at some places and in other places valleys and flat lands. This area of earth is called Lithosphere.

Out of the total area on earth three fourth area is Hydrosphere and one fourth is Lithosphere.

Now can you tell what is more on earth - water or land?

You must have read that all around earth there is air. We cannot see air but we can feel it when it flows. The air surrounding the earth is called atmosphere.

The thickness of atmosphere as compared to the size of earth is quite less.

What is Air Made up of ?

99% of air is found within 40km of height. The air contains 78% Nitrogen, 21% Oxygen and the rest 1% is of Carbon dioxide, water vapour, other gases and dust particles.

OUR EARTH



Materials required- Glass, Ice cubes.

Put ice cubes in a glass tumbler. Observe the outer surface of glass after some time? Where did the water droplets come from?

Water vapour is present in air when the air, comes in contact with the cold surface of the glass, the air condenses. With the result that the water vapour converts into small drops of water and are seen on the outer surface of glass.



Materials Required- A Plastic or glass bottle, bottle cork with two holes, thin glass tube or a straw and lime water.

Fill one fourth of the bottle with limewater and put the cork with two holes on it.

According to figure 1.3 a put the glass tubes A and B into the two holes. Seal the two holes with the wax of lighted candle, so that there is no gap left in the holes around the glass tubes.

The inner end of glass tube A should be totally dipped in the lime water and the inner end of tube B should be above the water surface. From the outer end of tube B suck the air out (fig.1.3b). By doing this, the air enters into the bottle from tube A because we see bubbles of air in the limewater.

After sometime the limewater turns milky because of carbon dioxide. This experiment thus shows that air contains carbon dioxide.



Figure 1.3 Presence of carbon dioxide in air.

ACTIVITY 4

Find a sunny room in your home or school. Close all doors and windows with curtains pulled down to make the room dark. Now, open the door or a window facing the sun, just a little

in such a way that it allows sunlight to enter the room only through a slit. Look carefully at the incoming beam of sunlight. Do you see some tiny shining particles moving in the beam of sunlight? What are these particles? They are dust particles present in air which varies from time to time and place to place.

Activity 1, 2 and 3 conclude that air contains some gases mainly nitrogen, oxygen, small amount of carbon dioxide, other gases, water vapours and dust particles. However, there may be some variations in the composition of air from place to place.

Atmosphere acts as a protective blanket for the earth. It saves the living beings on earth from harmful rays and extreme temperature of the sun.



Fill in the blanks.

- 1. The earth has been divided into three regions —, —, and —,
- 2. At the Poles water is in —— form.
- 3. _____ part of the total area of the earth is Hydrosphere and _____ part is Lithosphere.
- 4. Atmosphere has mainly—, ——and——gases.
- 5. _____gas turns lime water milky.

1.3 Earth and the Solar System

Sun is a star from which light and heat are being continuously emitted.

Some heavenly bodies revolve around the sun on a fixed path. They are called planets.

Sun had eight planets.

- 1) Mercury 2) Venus 3) Earth
- 4) Mars 5) Jupiter 6) Saturn
- 7) Uranus 8) Neptune

Now Pluto is not a Planet

To decide the definition of planets, in Czech Republic 2500 scientists of from countries took part in the International Conference of Astronomy. After deciding the definition of planets, scientists have found that Pluto is not a planet according to the definition.



They are arranged according to their distance from the sun. The nearest planet is mercury.

There are some heavenly bodies that revolve around the planets, These are called satellites. The planets and satellites are lit by sunlight. Sun, planets and satellites together make the Solar System or the solar family.

Satellites are of two types.

- 1) Natural satellites.
- 2) Artificial satellites.



A. Aryabhatta

B. Bhaskar C. Apple Figure 1.5 Artificial satellites of the earth

The heavenly bodies, which revolve around any planet, are called natural satellites. Apart from Mercury and Venus all other planets have their own natural satellite. The moon is the only natural satellite of the earth.

Any man-made celestial body that revolves around the plannet and are sent into space with the help of rockets are called are artificial satellites of the earth (figure 1.5).

These artificial satellites serve various purposes such as tele-communications, weather forecasting and gathering of information regarding the geography of earth.

ANSWER THESE	

- 1. Which is the planet nearest to the sun?
- 2. Which is the planet farthest from the sun?
- 3. With respect to the distance from the sun, what is the position of the earth?
- 4. Which is the planet nearest to the earth?
- 5. Name the natural satellite of the earth.

1.4 Basic Needs of life on the earth

1. Food: All living beings do work. Everyone requires energy to do work. The living beings obtain energy from the food they eat. Why do you feel hungry on returning home after playing? The energy of our body tends to decrease after playing. In order to retrieve back the lost energy food is necessary. Human beings and animals obtain their food from the plants, plant material and also from other animals, but green plants manufacture their own food with the help of CO_2 and H_2O in presence of sunlight.

2. Water: Water is necessary for existence. Green plants and all animals, in addition to food also require water for their survival. A large proportion of the total weight of living being constitutes of water (i.e. 70% of body weight). Water is very important for all the major activities and various processes taking place in the systems of the living beings.

3. Air: Apart from food and water being the necessities, living beings also require air for their survival. You must have noticed from your experience that while being in water, one cannot stay in water for a long time. Similarly, one can experience breathlessness when completely covered with a blanket. Living beings take in O_2 from the surrounding air.

ΑCTIVITY 4

Materials Required: Test tube, test tube holder, water, candle, burner, match - sticks etc.

Procedure:

- Fill half of the test tube with water.
- Hold the test tube with a test tube holder and heat the test tube.



• After some time you will notice small bubbles emerging from the boiling water.

This experiment shows that water has dissolved air in it.

4. Soil and Light: Other than food, water and air, living beings also need soil and light to sustain life.

The soil supports the green plants to remain in their position and in addition it

provides nutrition to the living plants. Soil also supports the life of many small organisms such as insects, earth worms etc. Light is also an important factor for their existence. Plants can manufacture food only in the presence of light. Sun is the major source of heat and light. It is utilized by all.

ANSWER THESE

- 1. Why do we eat food?
- 2. Why is water necessary for living beings?
- 3. Where do aquatic organisms obtain O_2 from?
- 4. How does soil help green plants?

1.5 The Earth: A Unique Planet of the Solar System

Of all the eight known planets in the solar system, earth is the only planet where life exists. The following features suggest why the earth is considered as the unique planet of the solar system:

- 1. The hydrosphere of the earth is ideal for the life of human beings and other living organisms.
- 2. Its atmosphere shows the presence of O_2 gas, which is necessary to maintain sustainability of life on earth.
- 3. The atmosphere serves as a protective covering that protects us from extremes of temperatures.
- 4. Water, which is a necessity of life exists here in huge proportions in various forms (ice, water and water vapour).

The earth, therefore, is the only planet that provides all the basic necessities of life (food, water, air) to all living beings.



The earth is round in shape.

- Crust: The uppermost layer of the earth, where soil, minerals, water and dead organisms and plants exists.
- Mantle: The middle layer of the earth, which shows the presence of melted rocks along with the associated gases.
- Core: The inner layer of the earth having very high temperatures.
- Hydrosphere: The total water content on earth.
- Lithosphere: The total landmass and the soil content present on the earth's surface.
- Atmosphere: The total covering of air present around the earth.
- Solar system: The sun along with the revolving planets and their satellites.
- Planet: A heavenly body revolving around the sun.
- Among all the planets in the solar system, Jupiter is the largest.
- The planet nearest to sun is Mercury.
- Satellite: A heavenly body that revolves around the planet.
- The Earth is the only planet of the solar system where all the necessary conditions for life are available.
- Apart from food, water and air, soil and sunlight are also required for life.



- (1) Choose the correct answer among the given options.
 - 1. Minerals are found in abundance in
 - a. Atmosphere
 - b. Mantle
 - c. Crust
 - d. Core
 - 2. Gas necessary for respiration is
 - a. Nitrogen
 - b. Air
 - c. Oxygen
 - d. Carbon Dioxide

OUR EARTH

- 3. Which of the following is not a planet
 - a. Venus
 - b. Mercury
 - c. Saturn
 - d. Moon
- 4. In the solar system, the earth is located between which of the two planets?
 - a. Mars and Mercury
 - b. Venus and Mercury
 - c. Mars and Venus
 - d. Mars and Jupiter

(2) Fill in the blanks -

- 1. The Innermost portion of earth is known as.....
- 2. is the only planet of the solar system where life exists.
- 3. gas present in air is used by the living organisms for breathing.
- 4. Green plants use......gas for the manufacture of their food.
- 5. INSAT is ansatellite of the earth.
- (3) State whether the following statements are true or false. Make the false statement correct.
- 1) The Sun is a star ()Moon is the natural satellite of the earth. 2) ()3) Air is soluble in water. () 4) The Sun revolves around the earth. () In the core solid iron and nickel metals are found. 5) () (4) Match the following -Satellite 1) Mercury Middle layer of earth. 2) Oxygen 3) Air taken during breathing Mantle Moon 4) Nearest planet to sun Nearest planet to earth Mars 5)

(5) Short answer questions.

- a. What is the importance of the three layers of earth?
- b. Make a labelled diagram of the inner structure of earth.
- c. What is the importance of oxygen for living beings?
- d. Experimentally explain the presence of CO_2 in air.

e. Write the names of the members of the solar system according to their distance from the Sun.

- f. Give the importance of artificial satellites.
- g. What are the basic requirements for sustaining life on earth?
- h. Why is the Earth called a unique planet?

THINGS TO DO:

- 1. Make a model of the solar family with your friends.
- 2. With the help of your teacher gather the following information for your scrap book.
- (i) Artificial satellite- name of countries that launch their satellites, year of launching satellites, name of space stations, photographs (if available)
- (ii) Name of space scientists, photographs, their contribution and achievements of space scientists.
- (iii) Collect informations of space travellers and the achievements of astronauts.

