

Class-6 (Science)

Chapter-12

Origin and formation of the earth

Lecture-1

Lesson: 1-5

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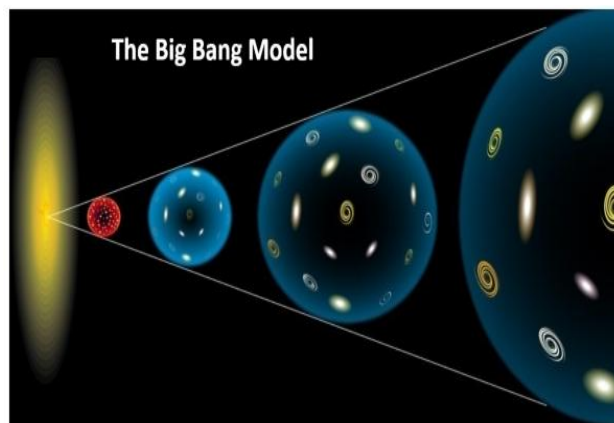
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Origin of the universe and the earth

The Big Bang Theory



Vigorous explosion or Big Bang



Expansion of universe

The most widely accepted explanation is the Big Bang theory about the origin of the universe and the earth. The event of big bang took place approximately 13.7 billion years before the present. This theory states—

- In the beginning, all matter forming the universe existed in one place in the form of a lump of small but severely heavy and hot body.
- At the Big Bang this tiny body exploded vigorously and scattered in all direction. This explosion is called vigorous explosion.
- After the explosion a very small particle (singular atom) was converted into minute particles.

- This minute particle became a bit cool and came together to form the astronomical bodies (the sun and other stars).
- The universe was expanding more in course of time.
- The galaxy and the stars in space are moving away from one another and the universe is expanding till now.
- The energy, matters, space everything of the universe is created from this vigorous explosion or big bang.

How was the earth created?

When the sun was created then its remaining portion of small particles was floating in the space like dust particles. After millions of years of that these dust particles came together and the earth was created about four billion years ago.

Solar System

All the revolved luminaries and the huge space around the sun is called solar system. The sun is the centre-point of the solar system. There are 8 planets, more than hundred satellites, thousands of asteroids and millions of comets in the solar system.

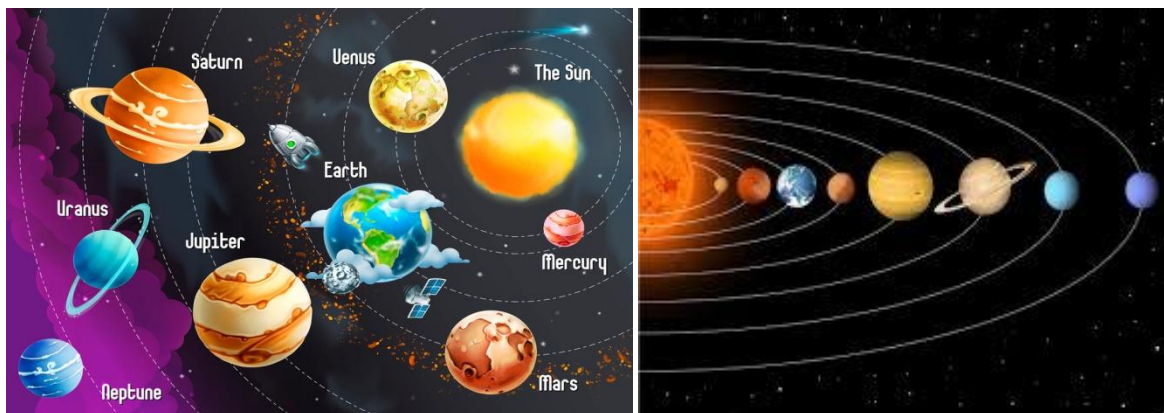


Figure-Solar system

The identity of the sun, the earth and the moon

Sun:

- The sun is one of the stars of Milky Way galaxy. Sun is a star because it has its own light. That's why sun is also called luminous object.
- The sun is a lump of burning gases. Hydrogen gases and other gases (mainly helium gas) held together in it due to gravitational forces. The atoms of hydrogen gas mixing with one another turn into the atoms of helium and produces huge amount of heat and light. Then that heat and light is scatted in all directions.
- The planets, satellites, comets etc. astronomical bodies orbit round the sun keeping it in the centre.
- The sun is 13 lac times greater than the earth.

- It is situated approximately 15 cores kilometers away from the earth, so it looks much smaller than its actual size.

Earth:

- The earth is one of the eight planets of the solar system.
- It orbits round the sun keeping it in the centre.
- It is the third closest planet to the sun.
- The shape of the earth is like a sphere.
- There are various gaseous substances in the earth.
- The earth cannot produce heat and light like sun. That's why the earth depends on the sun for light and heat.
- The earth is the only planet in which there are atmosphere and temperature necessary elements for the survivals of the plants and animals in the world.

Moon

- The moon is the only natural satellite of the earth.
- The moon orbits round the earth keeping it in the centre. The moon takes 27 days 8 hours to orbit the earth once.
- The moon itself cannot produce heat and light. It is a non-luminous object.
- The volume of moon is one-fifth of the earth.

Why does the moon appear to be luminous?

The moon is a non-luminous object. It cannot produce heat and light itself. Originally the light from the sun fall on the moon and it is reflected and that's why the moon is seen to be luminous.

Why do the sun and moon appear to be of the same size?

The sun is too far away from us, so it looks much smaller than its actual size.

Atmosphere:

The gaseous segment which surrounds and covers the surface of the earth is the atmosphere implicated in the surface of the earth being attracted by the gravity and being rotated along with the earth.

Properties of atmosphere:

- The atmosphere is mainly formed by nitrogen and oxygen.
- There are also water-vapour, dust particles, argon, methane, carbon-dioxide and some other gases in the atmosphere.
- The atmosphere near to the earth surface is denser because earth attracts gases towards it by gravity.
- The atmosphere will be lighter and thinner moving above the earth's surface.

Layers of atmosphere:

Earth's atmosphere is divided into few layers. The first two layers are—

Troposphere:

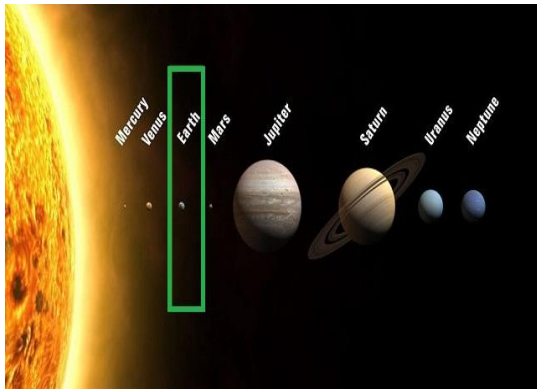
- The atmosphere up to 11 kilometers from the earth surface is called troposphere.
- It is the most essential level for human beings, because gases, moistness, clouds, fogs, rains, Steams of air, etc. are noticed in this layer.

Stratosphere:

- The atmosphere up to 39 kilometers from the end of troposphere is called stratosphere.
- It is extended up to 50 km from the earth surface.
- This layer contains a gas named ozone which protects living beings from the injurious rays (ultra-violet rays) of the sun.
- There is a very small amount of gases.

Why the earth is suitable for habitation of living beings?

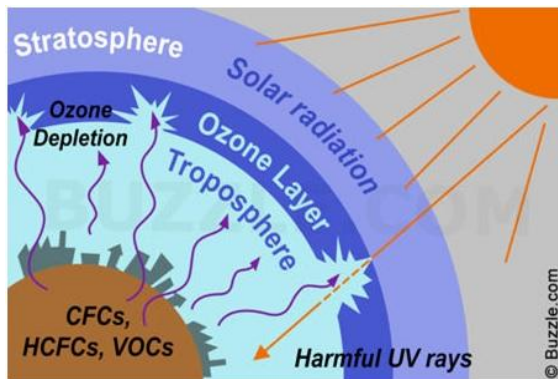
There are many factors which are responsible for the existing life on the earth are discussed below:



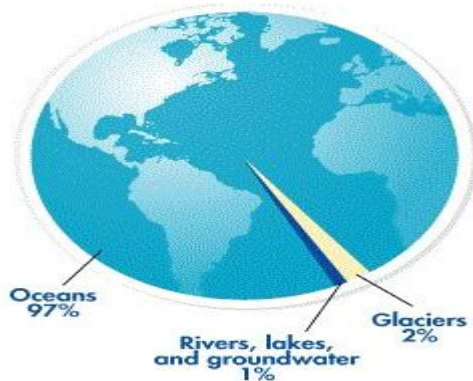
Distance of the earth from the sun



Importance of earth's atmosphere



Importance of ozone layer



Presence of water

- At the time of cooling down of the earth, the heavy particles went towards the centre and light particles remained near the surface of the earth. Gaseous substances such as carbon dioxide, water vapor, methane, nitrogen, etc. formed the atmosphere. The atmosphere plays a vital role in order to help all creatures live in the earth. The air content of carbon dioxide on the earth is less than that of planets like Venus and Mars. Hence, the less air content of carbon dioxide helps to moderate the earth's temperature and is absorbed by plants during photosynthesis to produce oxygen. The increased amount of oxygen and nitrogen in the atmosphere are essential for plants and animals.
- Ozone gas makes a level in the atmosphere which protects living beings from the injurious rays (ultra-violet rays) of the sun.
- Water is very important for life. The earth is covered by three-fourth of the water. Earth is the only planet which hosts liquid water on its surface. It has unique surface which neither too hot nor too cold.
- Earth is the only planet that uses the sun's light as a source of energy. The distance of the earth from the sun makes it a perfect reason for the life because it receives the perfect amount of heat and light to allow life to be created and to support it.

Questions

1. State the Big Bang Theory.
2. How was the earth created?
3. What is solar system?
4. Write down a short note on the sun.
5. How is the sun produced heat and light?
6. Why does the moon appear to be luminous?
7. What is atmosphere?
8. Describe the properties of troposphere and stratosphere.
9. Why the earth is suitable for habitation of living beings?