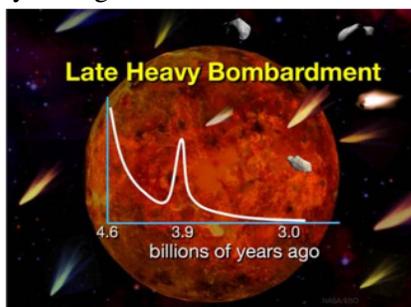
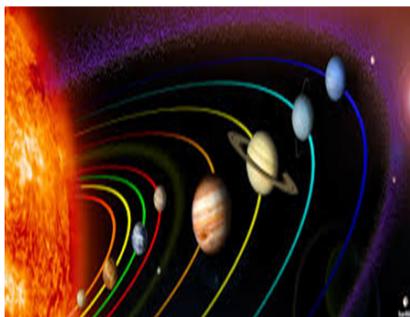


# 1. Origin of Earth and Evolution of the Environment

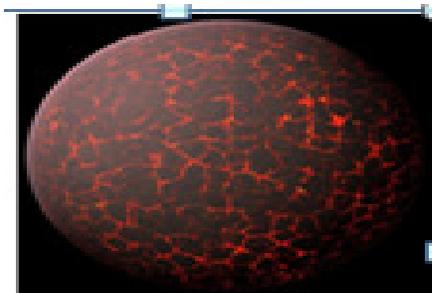
- Our earth, with all its diversity along with other planets and their satellites, the sun, the moon, the many galaxies (huge groups of millions of stars) form the universe
- The 'Sun' is also a star. It is the star nearest to earth – about 150 mk (million kilometers) away. A solar system consists of a star in the middle with a number of planets orbiting around it.
- The widely accepted theory of the origin of universe is the "BIG BANG" theory.
- Universe started with a huge explosion and matter (dust and gases) filled the entire space. The temperature of the universe then, was about hundred billion degrees Celsius. Scientists believe that the big bang occurred about 15 to 20 billion years ago



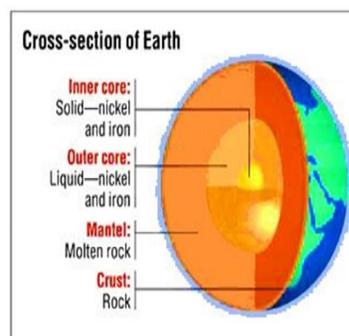
- The huge collection of dust and gases then began to spin. As it spun faster and faster, the centre became very hot. It became the Sun. From the edges of this ball of dust and gas, big blobs or chunks of dust broke off and formed eight ball shaped planets. This founded our solar system



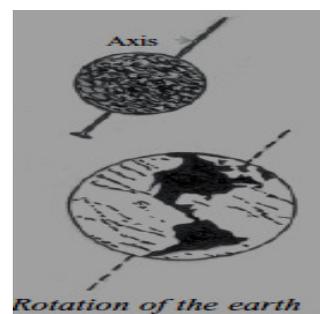
- The earth broke off about 4.5 billion years ago with an explosion. It was a burning hot white mass of gas and dust. Over a long period of time, dust and gas gradually condensed to form solid rock.



- The crust of the earth was formed from cooling and hardening of the molten matter and hot gases. With cooling of the earth the crust hardened and formed the land. Cooling of the earth also condensed water vapour into liquid water filling the depressions to form seas.
- A planet's axis is an imaginary line passing through the centre of the planet.
- About 32 km deep you would reach the part of earth which is called mantle. This is made of hard rock. The centre or core of the earth is approximately 6,400 km from the surface having a temperature close to 5000°C. Much of the earth's core is hot liquid.



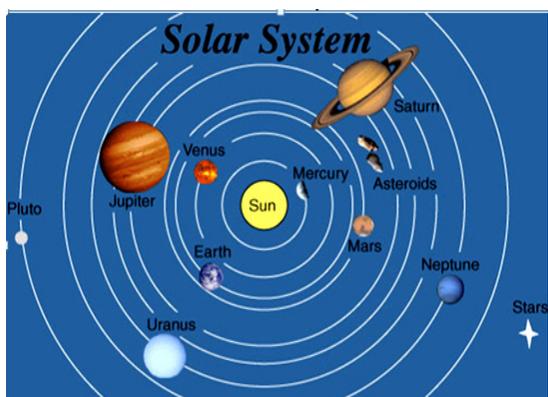
- The earth rotates on its axis, so the day and night cycle is of 24 hours completed.



- Earth also revolves around the sun. Moon completes its one orbit in 27.33 days
- From the space, earth looks like a beautiful bright bluish planet because of its blue oceans.

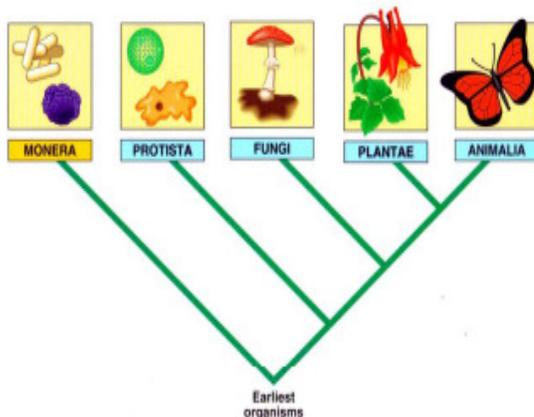


- In solar system, earth is the only planet which is known to sustain life.
- Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Earth are the planet of the solar system

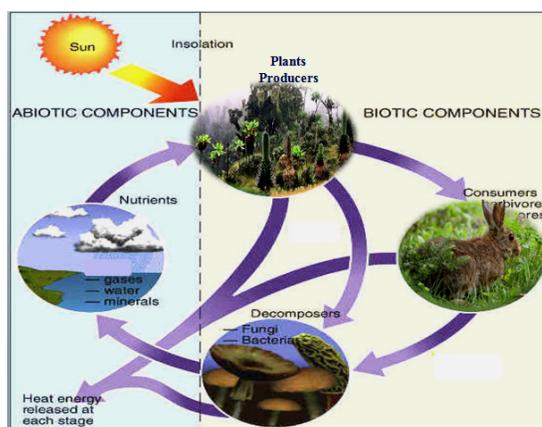


- Presence of water, atmosphere, temperature and buffering capacity of the earth are the conditions which have enabled it to sustain life
- In the beginning, conditions on earth were not suitable for life, primitive atmosphere contain methane, ammonia, carbon dioxide and hydrogen, water vapor but no oxygen.
- When earth cooled, water vapor, condensed to form liquid water, molecules of life were evolved as bacteria, the earliest and simplest organisms.

- After two billion years, different from bacteria lived on earth. As time passed, protists evolved from bacteria, multicellular organisms the fungi, followed by plants and animals. At present diversity of organisms is comprised of five kingdoms of life Monera, Protocista, Fungi, Plantae and Animalia.



- Surroundings or conditions in which an organism lives or operated is known as an environment. The environment broadly includes abiotic (light, climate, water, substrata) and biotic (plants, animals and microorganisms including human beings) components.





### Check Yourself

1. Most acceptable theory of origin of universe as-  
a. Cosmos theory b. Big Bang theory c. Spontaneous theory d. Chemosynthetic theory
2. Time period of one revolution by earth around the sun-  
a. 24 hours b. 48 hours c. 27.33 days d. 365 days
3. Average Temperature for survival of living organisms is-  
a.  $16^{\circ}\text{C}$  b.  $98.3^{\circ}\text{C}$  c.  $273^{\circ}\text{C}$  d.  $33^{\circ}\text{C}$
4. Humans were evolved on earth in ----- era.  
a. Paleozoic b. Mesozoic c. Cenozoic d. Precambrian
5. Earth's atmosphere is made up of -----.  
a. 21%  $\text{O}_2$  b. 78%  $\text{N}_2$  c. .038%  $\text{CO}_2$  and inert gases d. All the above

**Answer: 1(b); 2(a); 3(a); 4(c); 5(d)**



### Stretch Yourself

1. Why do we consider earth is a unique planet of our solar system?
2. Name the coldest planet and its position in solar system.
3. Define the term environment.
4. Name the five kingdom of classification



### Test Yourself

1. Mention different layer of earth in brief.
2. 'All organisms depend on environment for their survival.' Explain in your own words.
3. Why do we consider earth as a unique planet for supporting life?
4. Mention the conditions which are necessary for sustaining life.