Unit One

Physical Characteristics of the Earth

1.1. Origin of the earth and the solar system

A. The origin of the Earth

The origin of the Earth is intimately related to the formation of the solar system. Some scientists believe that the sun, planets and other smaller bodies in the solar system were formed from a large flammable of hot swirling gases.

The flammable was loosely packed gases, largely made up of hydrogen and helium, and dust particles. Gradually, the gases and dust particles drew together because of gravitational pull and formed a thin disc. T hrough time, the disc split into rings and kept spinning.

The spinning rings at the center formed the sun.The outer rings resulted in the formation of the eight planets, including the earth. Geologists estimate that the earth was formed 4.6 billion years ago.

Till August 2006, Pluto was considered a planet. However, in a Meeting of the International Astronomical Union, a decision was taken that Pluto like other celestial objects (Ceres, 2003 and UB_{313}) discovered may be called "dwarf planets"

B. Members of the solar system

Our solar system is made up of a star, eight planets and countless smaller bodies such as dwarf planets, asteroids and meteoroids.

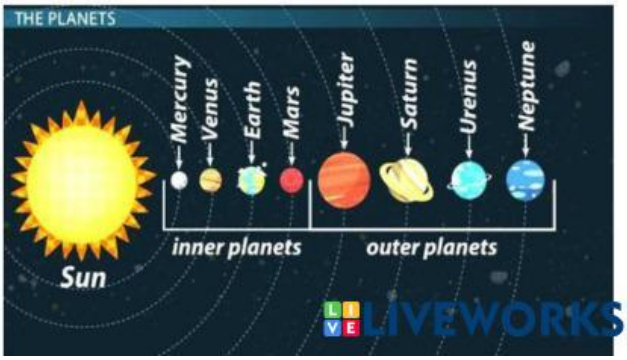
I. The Sun

The sun is the centre of the solar system. It is huge and made up of extremely hot gases. It provides the pulling force that binds the solar system. The sun is the ultimate source of heat and light for the solar system. But that tremendous heat is not felt so much by humans because despite being our nearest star, it is far away from us. The sun is about 150 million km away from the earth.

The sun is a star, just like many of the stars that you can see in the night sky. It is the largest object, comprising 99.8% of the system's mass.

II. Planets

The word 'planet' comes from the Greek word "Planetai" which means 'wanderers'. There are eight planets in our solar system. All the planets revolve around the Sun on paths called orbits. The orbit is elliptical in shape. In order of their distance from the sun, they are classified in to two; inner planets and outer planets.



Inner planets

The Planets The four planets closest to the Sun - Mercury, Venus, Earth, and Mars are the inner planets. They exist in solid state. Astronomers call them the "terrestrial planets" because they have solid and rocky surfaces. Compared to the outer planets, the inner planets are small in size.

Outer planets

Jupiter, Saturn, Uranus, and Neptune are the outer planets of our solar system. These planets are farthest from the Sun. The outer planets are much larger than the inner planets. Since they are mostly made of gases, they are also called gas giants.

1.1 Origin of the earth and the solar system

Worksheet One

1. **What is believed to be the origin of the Earth and the solar system?**

   a) A solid rock explosion

   b) A collection of icy bodies

   c) A large flammable mass of hot swirling gases

   d) Collisions of comets

2. **What were the swirling gases primarily made of?**

   a) Oxygen and nitrogen

   b) Hydrogen and helium

   c) Carbon dioxide and methane

   d) Argon and neon

3. **What force pulled the gases and dust particles together to form a disc?**

a) Magnetic force b) Frictional force

c) Gravitational force d) Nuclear force

4. **What did the center of the spinning disc eventually form?**

a) Earth b) Pluto c) The Moon d) The Sun

5. **What formed from the outer spinning rings of the disc?**

a) Comets b) Stars c) Planets d) Moons

6. **How old is the Earth estimated to be?**

a) 3.5 million years b) 4.6 billion years

c) 10 billion years d) 1.2 million years

7. **What classification was given to Pluto in 2006?**

a) Inner planet b) Gas giant

c) Dwarf planet d) Star

8. **Which organization reclassified Pluto as a dwarf planet?**

a) NASA

b) United Nations

c) European Space Agency

d) International Astronomical Union

9. **Which of the following is NOT a member of the solar system?**

a) Asteroids b) Dwarf planets

c) Comets d) Galaxies

10.What is the central object of the solar system?

a) Earth
b) The Moon
c) The Sun
d) Jupiter

11.What is the sun primarily made of?

a) Ice and dust
b) Liquid magma
c) Hot gases
d) Rock and metal

12. How far is the Sun from the Earth?

a) 1.5 million km
b) 150 million km
c) 15 million km
d) 1.5 billion km

13. How much of the solar system's mass does the Sun hold?

a) 50%
b) 75%
c) 99.8%
d) 25%

14. The word "planet" comes from a Greek word meaning:

a) Shiner
b) Wanderer
c) Giant
d) Orb

15. What shape are the orbits of the planets?

a) Circular
b) Irregular
c) Triangular
d) Elliptical

16. Which of the following are inner planets?

a) Jupiter and Saturn
b) Mercury and Mars
c) Neptune and Uranus
d) Saturn and Earth

17. Why are the inner planets called "terrestrial planets"?

a) They are full of water

b) They have ring systems

c) They are gaseous

d) They have solid, rocky surfaces

18. Which of the following is NOT an inner planet?

a) Venus

b) Earth

c) Jupiter

d) Mars

19. Which planets are known as the gas giants?

a) Mercury, Venus, Earth, Mars

b) Neptune, Uranus, Pluto

c) Jupiter, Saturn, Uranus, Neptune

d) Earth, Mars, Jupiter

20. Why are the outer planets called gas giants?

a) They are small and rocky

b) They are made mostly of gas

c) They orbit faster

d) They are close to the sun