Topic 1: WHAT IS SPACE AND UNIVERSE?

Before You Begin

Look at the picture. Discuss what you see.

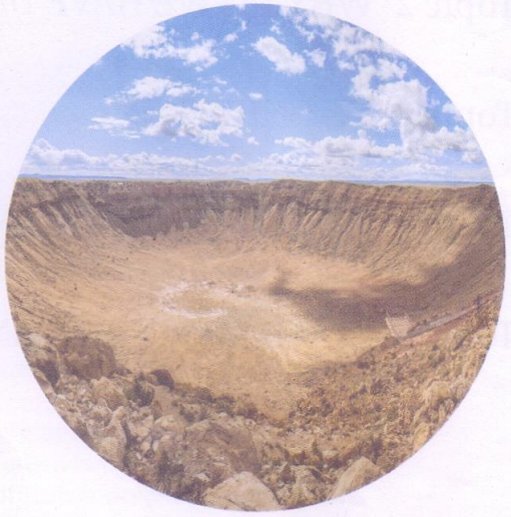
LET US LEARN

What is Beyond the Earth?

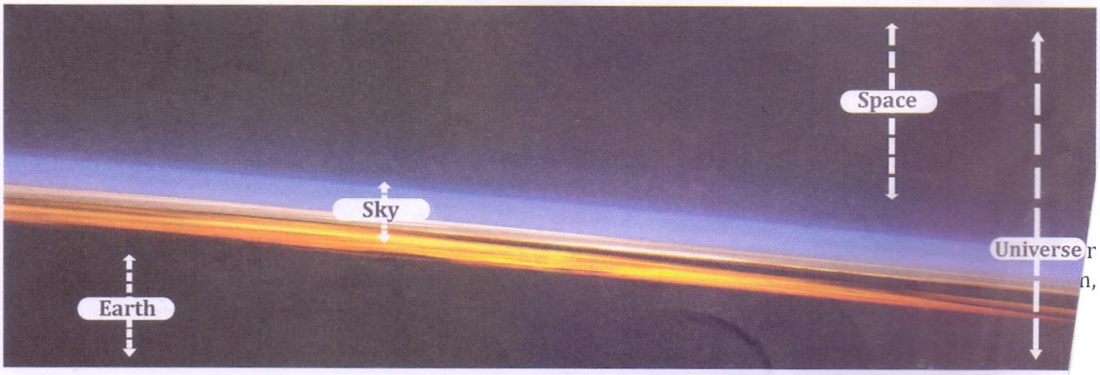
We see a lot of objects in the sky over our Earth. But do you know that there are many more things that lie in **space**, a region beyond the sky, that we cannot see?

Think About It

This is a picture of the Barringer **Crater** in Winslow, Arizona, United States of America. It is believed that an object from space crashed on the Earth's surface, leaving behind this **gaping** hole.



The different objects present in space are stars, planets, **satellites** and **galaxies**. Satellites are objects that orbit (move around) planets. Galaxies are a large group of stars. All these objects, and more. are present in the universe and are called 'heavenly bodies'. The Sun, moon, stars, planets, **asteroids** and **meteoroids** are other examples of heavenly bodies.



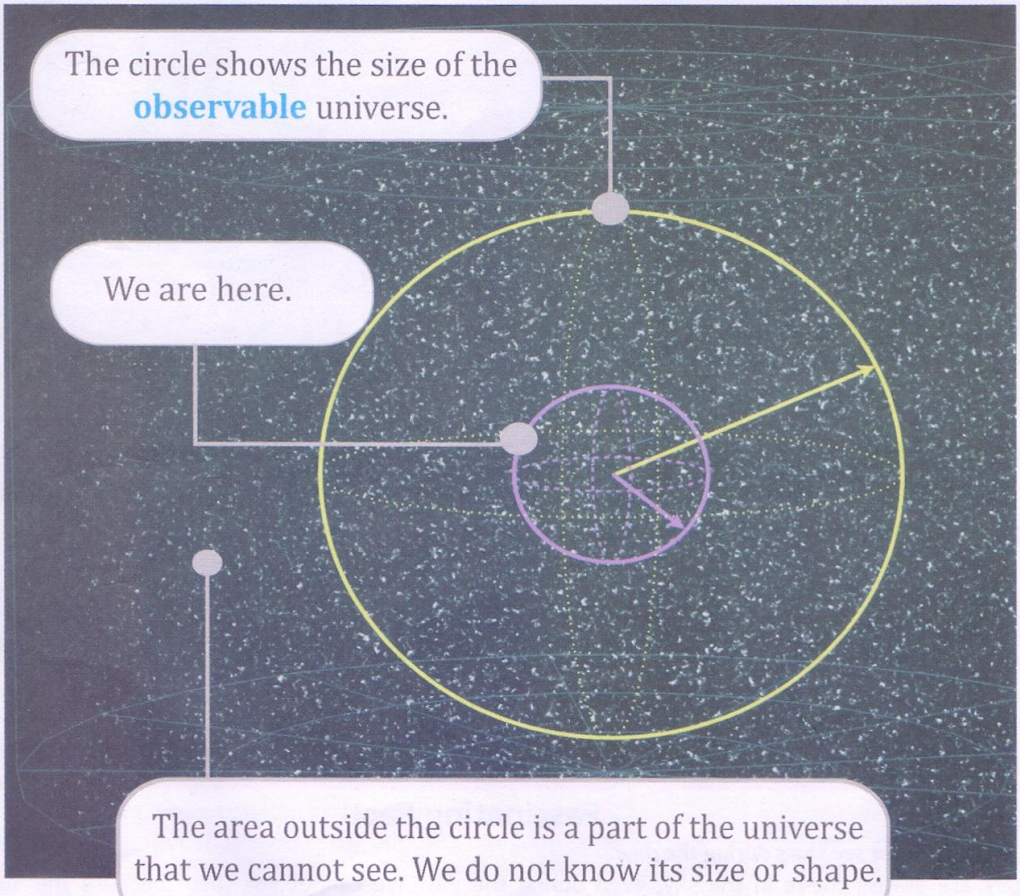
Some heavenly bodies such as the Sun, moon and stars are big in size and close to Earth. Therefore, we can see them. However, other heavenly bodies such as planets, asteroids and meteoroids are very far from the Earth. Therefore, we can see them only through a **telescope**.

How Big Is The Universe?

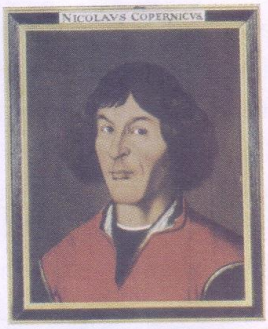
Astronomers have not yet been able to determine the actual size of the universe because it is getting bigger and bigger each second. The universe is expanding due to the outward movement of galaxies in all directions at a rate that is more than anyone can possibly imagine!

Fascinating Fact

- ***How many stars are there?*** There are so many stars in the sky that even if all the people in the world kept counting for their entire lives, they would still never be able to count them all. There are more stars in the universe than grains of sand on the Earth. That is at least a **billion trillion** stars.

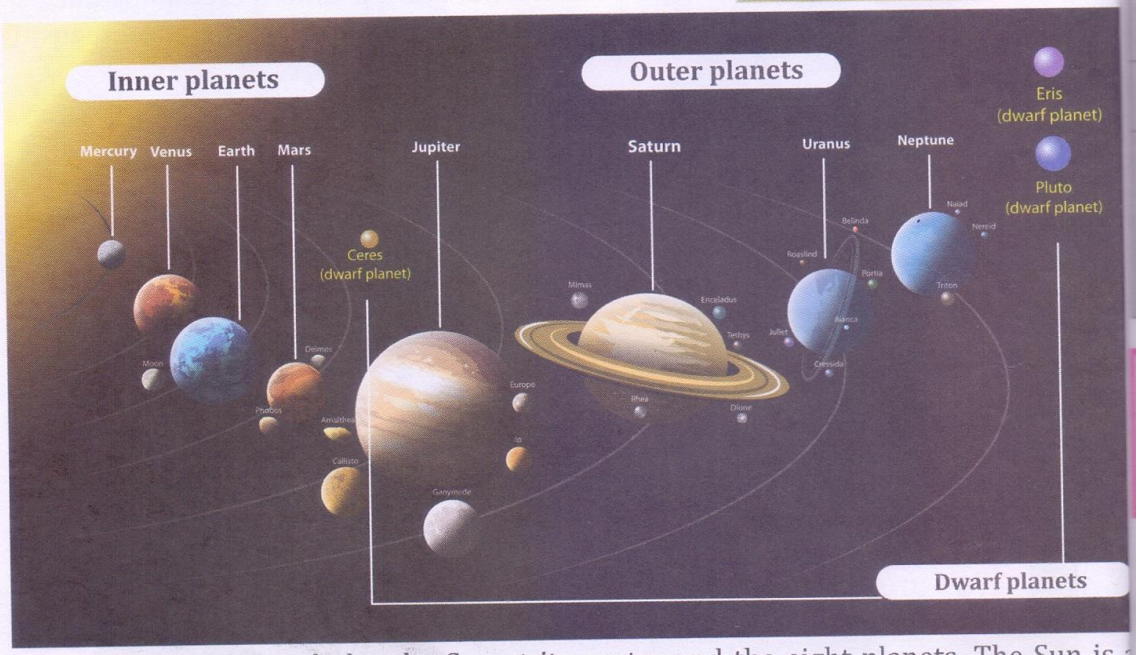


Inner, Outer and Dwarf Planets



Many years ago, people believed that the Earth was the centre of the universe and the moon, Sun, planets and stars revolved around it.

Nicolaus Copernicus was an astronomer who first suggested that the Sun was the centre and that the moon and planets went around it.



Our Solar System, includes the Sun at its centre and the eight planets. The Sun is a bright star.

Planets are big space objects that orbit the Sun. Each planet rotates or spins around its own **axis** as it revolves or orbits the Sun. Planets look like bright stars and keep changing their position every night. The four rocky planets closest to the Sun are Mercury, Venus, Earth and Mars. These form the inner planets.

Farther from the Sun, are four giant gas planets - Jupiter, Saturn, Uranus and Neptune. These form the outer planets. Pluto, Ceres and Eris are dwarf planets. Pluto is made up of rocks and ice. The other bodies that orbit the Sun include the planets' moons, many asteroids and comets.

Fascinating Fact

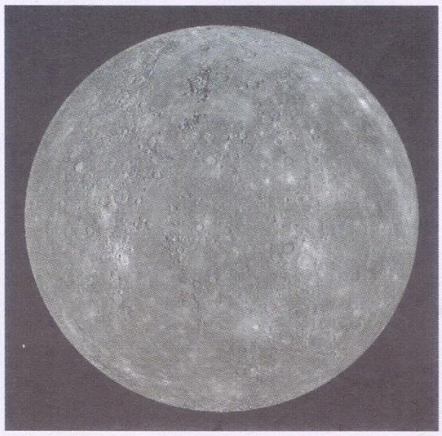
- ***Why can we not see stars during the day?***
  Stars are always the-re in the sky, even during the day. We cannot see them because the Sun's brightness outshines them. When night falls, they show up clearly against the dark sky.

Features of Planets

Each planet has a different **atmosphere** of clouds, gases and dust which is held together by its gravity. **Gravity** is what holds everything on the ground and stops it from flying into space. The strength of gravitational force of different planets varies. Earth is the only known planet to have an atmosphere fit for breathing. The gravity of the Earth helps us to walk, run and stand on it.

Mercury

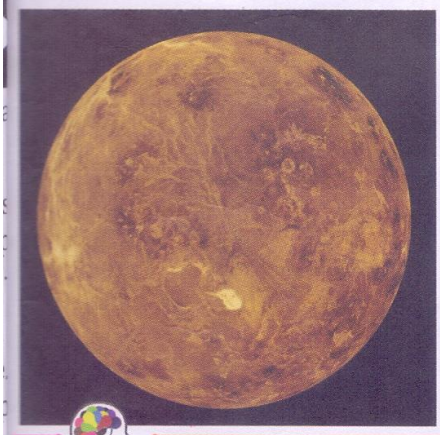
Position from the Sun:	First planet
Colour:	Dark grey
Distintictive Characteristics:	• Smallest planet • Has no atmosphere • Fastest orbiting planet around the Sun • No life has been found



Fascinating Facts

- It is so hot on Mercury that a tin pan would melt there.
- Although Mercury is closest to the Sun, it has ice on its surface. This ice is found in craters that do not receive any sunlight.

Venus



Position from the Sun:	Second planet
Colour:	Reddish-brown
Distinctive Characteristics:	• Known as the 'Evening Star' or 'Morning Star' as it can be seen from the Earth, just after sunset and before sunrise • Has an atmosphere with high amount of carbon dioxide gas • Carbon dioxide gas traps the heat from the Sun, making it the hottest planet in the Solar System, even hotter than Mercury.

Fascinating Facts

- During the day, Venus gets so hot that it can melt a **cannon** ball.
- Venus has the slowest rotation in the Solar System. It has a **retrograde** rotation (it rotates in the opposite direction from the Earth's rotation). If you stand on Venus, you will feel that the Sun rises in the West and sets in the East.