



THE EARTH IN THE SOLAR SYSTEM

GEOGRAPHY

During the day, the Sun is the only natural object seen in the sky except occasional clouds, birds or aeroplanes. However, one must not look at the Sun directly which hurts the eyes badly. At night we can see thousands of stars as well as the Moon in the sky.

Watching the Night Sky

We have a large number of clear nights in a year. As the darkness grows after the sunset, the whole sky is filled with tiny shining objects – some are bright, others dim. Most of them appear to be **twinkling**. They are stars. After a very careful and long watch you may find few of them **not twinkling**. They simply glow without any flicker. They are planets.

You may also notice the Moon in the night sky at different times, at different positions and in different shapes. **Full Moon** can be seen only once in about 28 days. Its shape wanes day by day, its timings decrease and its position changes. After 14 days, it becomes invisible. We call it a **New Moon** night or **No Moon** night or *Amavasya*. The word New in 'New moon' does not literally mean new. Then it waxes day by day and becomes a Full Moon in about 14 days. This is called a **Full Moon** night or *Poornima*.

During the daytime the glare of the bright sunlight does not let us to see all these bright objects visible in the night sky. The Sun, the Moon and all those objects shining in the night sky are called **celestial** or **heavenly bodies**.

Stars


The **twinkling** shining objects of the night sky are called **stars**. In fact, they are not as small as we see them. They look so tiny as they are very very far away. The stars are very huge balls of burning gases emitting out a lot of heat and light. They are similar to the Sun. We do not feel their heat or light because of their great distance from us. Our Sun is also a star. It looks big as it is much nearer to the Earth than the other stars.



Night sky



Stars



There are so many stars in the sky. Just about 7000 stars could be seen around from the Earth with the naked eye. Yet only 2000 stars can be seen at any one time. In fact, there are so many stars in the sky that even if all the people were to start counting these stars, they could still never count them all during their lifetime.

Constellations

Groups of bright stars in the sky that form characteristic patterns of shapes and appear to move together are called **constellations**. People of ancient civilizations attributed figures of animals, persons and mythical beasts *to make it easy to remember* them. There are about 88 constellations known till date. Some of the constellations can be easily identified with the naked eye. But one must know about their appearance, i.e. how they look like and the position, i.e. where they are found in the sky. Some easily identifiable constellations are Ursa Major, Ursa Minor, Orion etc.

The best known group of stars is the Big Dipper or *Vrihat Saptarishi*. The Big dipper is a group of seven bright stars, 3 of which form a handle (or arc) and 4 of which form a bowl (nearly square shape). Thus the Big Dipper appears like a big ladle or question mark. This name Big Dipper is derived from the word 'Dipper' meaning a large spoon that was used in ancient times for drinking water. The Big Dipper is part a of the constellation **Ursa Major** or **Great Bear**. Along with other faint stars Big dipper forms the figure of a bear, hence the name Great Bear.



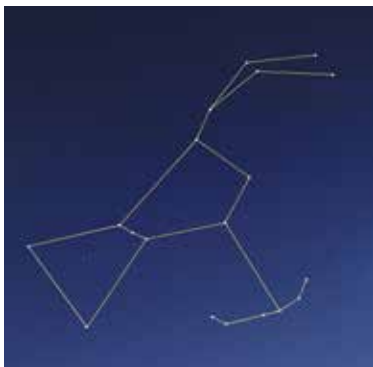
Relative position of stars in Ursa Major and Ursa Minor

In ancient times, people used to determine directions during the night with the help of stars. The North star indicates the north direction. It is also called the **Pole Star**. It always remains in the same position in the sky. We can locate the position of the Pole Star with the help of the Saptarishi. The Pole Star is seen along the imaginary extended line joining the first two stars (bowl part) of the Great Bear.

The **Little Dipper** is an almost mirrored and smaller version of the Big Dipper. It also contains seven stars. The Pole Star forms the handle tip of the Little Dipper or the **Ursa Minor** or the **Little Bear**.

These constellations are usually visible during spring from our part of the world.

Orion or *Kalpurush* becomes visible in the winter. Stars belonging to it appear as a hero standing with a bow and arrow in hand.



Relative position of stars in Orion

Planets

If you watch the sky for an hour or more at night or you watch it around the same time on different nights, you will find that the stars change their positions in the sky. They appear to move (revolve) round the earth from east to west, arising in the east and setting in the west. If you observe carefully, you will find that their **relative positions** do not change except for the relative positions of the five star-like objects which are visible to the naked eye and which travel through the sky

without twinkling. These are known as the 'wanderers' or the planets. The word 'planet' come from the Greek word 'Planetai' which means 'wanderers'.

Planets do not have their own heat and light. They are lit by the light of the stars. The Earth on which we live is a planet. It gets all its heat and light from the Sun, which is our nearest star. If we look at the Earth from a great distance, from space, it will appear to be shining just as the Moon. Like our Earth, there are seven other planets and three plutons (or dwarf planets) that get heat and light from the Sun. Let us view differences between the stars and the planets.

Stars	Planets
1. Stars are made up of hot burning gases.	1. Planets are made up of either solid material (rocks) or of cool gases.
2. Stars emit their own light.	2. Planets reflect the light that they receive from the Sun.
3. Stars are very large.	3. Planets are not as large as the stars.
4. Stars are very hot.	4. The temperatures of planets depend on their relative distance from the Sun as they receive heat from the Sun.
5. Stars do not change their relative position in the sky every day.	5. Planets change their relative position in the sky every day.
6. Stars twinkle.	6. The planets do not twinkle.
7. There are millions of stars.	7. There are eight planets and three plutons (or dwarf planets).

Solar System

The word **Solar** comes from **Sol**, the Latin word for the Sun. The Sun, eight planets, three plutons, satellites, asteroids and meteoroids together form the solar system. The Sun is the centre of the solar system and is its largest member and head of the *solar family*, as the solar system is called.

The Sun

The Sun is in the centre of the solar system. It is huge and made up of extremely hot burning 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. The temperature of the surface of the Sun is about 6000°C which increases to 20 million degrees Celsius in the interior. But that great heat is not felt so much by us because it is about 150 million km away from the Earth. The diameter of the Sun is about 100 times that of the Earth. The Sun is nearly 300,000 times the weight of the Earth.

The Sun is also a star. It is a medium sized star. It looks so big because it is the **closest star to Earth**. Sunlight travels at the speed of about 300,000 km per second. Yet, even with this speed it takes about eight minutes to reach the Earth.




Fact File

The ordinary sunlight is made of 7 colours – violet indigo, blue, green, yellow, orange and red. The blue coloured light is scattered by Earth's atmosphere. Hence it appears to us that the sky is blue. At sunset dust particles in air reflect red light which reaches us faster. Therefore the part of the sky around the Sun appears red.



Sun



The star nearest to the Sun is Proxima Centuri. It is at such a distance that we express its distance in light years. One **light year** is equal to the distance light travels in a year. The light travels a distance of about 9,500 billion km in one year. Proxima Centuri is more than 4.24 light years away from us.

Planets in the Solar System

The celestial bodies which do not have their own light and go around the Sun in near circular orbits once in less than 200 years are called **planets**. There are eight planets in our solar system. In order of their distance from the Sun, they are : Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. All these eight planets move around the Sun in fixed paths. These paths are elongated, elliptical or oval shaped, i.e. near circular. The paths are called **orbits**.

The Number of Planets

Prior to 1992 only 9 celestial bodies were known moving around the Sun. In 1992 several other celestial bodies moving around the Sun in **highly tilted orbits** were found other than these 9 bodies. International Astronomical Union reclassified all the celestial bodies moving around the Sun on 23rd August 2006. It added a new point to the definition of a **planet** that **it should not take more than 200 years to revolve around the Sun**. As the ninth body Pluto takes 248 years to revolve around the Sun so it was classified as a planet no more.

Now there are **eight planets**– Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune revolving around the Sun in near **circular orbits** having period of revolution less than 200 years.

There are **three plutons** (or **dwarf planets**) revolving around the Sun in **highly tilted orbits**–(i) Pluto and (ii) Ceres (iii) Xena (2003 UB313), having period of revolution more than 200 years.

The planets are placed at different distances from the Sun, so they do not collide against each other, while going round the Sun. The force of gravity also holds them in their regular path around the Sun. Gravity is the force that attract a body towards the centre of another body. The Sun has enormous mass and weight. Its force of gravity, therefore, controls the movement of the planets.

The planets have different mass and weight. They are also made of different materials. Planets closer to the Sun– Mercury, Venus, Earth and Mars are **rocky**. The farthest four– Jupiter, Saturn, Uranus and Neptune

are made of **cool gases**. Therefore, they take different time to make one complete round of the Sun. The orbital movement of planets around the sun is called **revolution**. The planets also spin on their imaginary axis. The spin of planets on their axis is called **rotation**.



The solar system

The distance of a planet from the Sun is chiefly responsible for the amount of energy received from the Sun. Mercury, nearest to the Sun is also the hottest planet and Neptune, the farthest is also the coolest planet in the solar system.

The planets are generally placed in two groups :

The inner planets are Mercury, Venus, Earth and Mars. They are closer to the Sun than the outer planets. They are made of rocks. They are also called **terrestrial planets**, i.e. Earth-like planets.

The outer planets are Jupiter, Saturn, Uranus and Neptune. They are also called **gas giants**, as they are mostly made up of gases. They are very very far from the Sun.

Some Interesting Information about the Planets

Planet	Diameter in km	Time for one spin on axis	Time for one orbit around Sun	Min. distance from Sun in million km	Max. distance from Sun in million km	Number of Moons
Mercury	4,880	59 days	88 days	46	70	--
Venus	12,104	243 days	255 days	108	109	--
Earth	12,756	1 day	365 days	147	152	1
Mars	6,794	1 day	687 days	207	249	2
Jupiter	142,984	9 hours 56 minutes	11 years 11 months	741	816	16
Saturn	120,536	10 hours 40 minutes	29 years 5 months	1350	1510	about 18
Uranus	51,118	17 hours 14 minutes	84 years	2730	3010	about 17
Neptune	49,532	16 hours 7 minutes	164 years	4460	4540	8

Note : (a) Diameters are approximated to the nearest km.
 (b) Time is approximated to the respective nearest minute, day, month or year.
 (c) Distances are approximated to the nearest million km.
 (d) Time for one spin on axis, time for one orbit around the Sun and number of Moons follow the NCERT.
 (e) Number of Moons of Saturn and Uranus are not yet confirmed by the International Astronomical Union because various conditions in the space around the outer planets cause obstructions in observation through telescopes. The number of Moons given above (source NCERT) differs from other sources.



Mercury



Venus



Earth



FACT FILE

The Earth orbits round the Sun at 1,07,220 km per hour and makes one revolution round the Sun in 365 days, 5 hours, 48 minutes and 45.51 seconds. It rotates on its axis every 23 hours, 56 minutes and 4.09 seconds.



Mars

Let us know more about these planets.

Mercury, the *Innermost Planet* is the planet closest to the Sun. This makes it the hottest planet. It is a luminous planet having yellow colour. Its size is the same as that of our Moon but looks smaller. Mercury can be seen in the eastern sky for about eight weeks in September and October just before the sunrise. Thereafter, it can be seen in the western region of the sky immediately after the sunset for about eight weeks.

Venus, the *Veiled Planet* is named after Roman Goddess of Love and Beauty. It is almost like the Earth in size and mass and therefore, it is also called the 'Earth's twin'. As it is the brightest object in the sky after the Moon hence it is easy to locate. The Venus appears as an *evening star* for 292 days just above the western horizon. Thereafter, it appears as a *morning star* for 292 days in the eastern sky. It is called the Veiled Planet since it is surrounded by a thick cloud cover. This cloudy atmosphere reflects almost $\frac{3}{4}$ th of the sunlight falling on it making Venus the brightest planet.

Venus is the only planet except Uranus that rotates from *east to west* about its axis. All other planets rotate from *west to east* about their axis. So, if any one stands on Venus, he will see the Sunrise in the west and set in the east.

Earth, the *Blue Planet* or the *watery planet* is the only planet which has life on it. That is why it is a unique planet. Conditions favourable to support life are probably found only on the Earth. One chief reason for existence of life on Earth is that it is neither too hot like Mercury nor too cold like Jupiter. Water is found in all its three forms of liquid, gaseous and solid. At the ground level of the atmosphere there is substantial presence of oxygen which is needed by living things for respiration. There is also ozone layer of the atmosphere. It does not allow harmful ultra-violet rays of the Sun reach the ground. Life-forms on Earth, i.e. plants and animals including human beings survive because of the energy emitted by the Sun.

In size Earth is the fifth largest planet of the solar system. It is slightly flattened at the poles. The Earth pulls every thing on it including water and air to its surface with its gravity that is why people and things do not fall off the Earth. Its two-third surface is covered by water. Therefore, it appears blue from the outer space. That is why it is called a **blue planet**. Our Earth is also a celestial body.

Mars, the *Red Planet* is named after Roman God of War. It appears red due to the presence of iron-rich red soil. Mars can be seen from the Earth for most part of the year. Its diameter is slightly more than half of the Earth. However, its mass is only one-ninth of that of the Earth. The surface of Mars is covered with deserts, high mountains, deep craters, volcanoes etc. It has a thin atmosphere but no water.

Jupiter, the *Giant Planet* is the largest planet named after the ruler of the Roman God. Its mass is more than the combined mass of all other planets. Mainly it consists of hydrogen and helium present in gaseous form. It also has faint rings around it. It is a white-planet with a yellowish touch. It is located at a distance five times greater than that of the Earth from the Sun.



Jupiter

Saturn, the *Jewel Planet* is named after Jupiter's father in Roman Gods. It is the most beautiful planet because of the three rings made of ice and ice covered dust particles. It is made up of gases with a very low density. Its size and composition is similar to Jupiter. However, it is cooler than Jupiter.



Saturn

Uranus, a *Planet on its Side* is named after the Roman God of the Sky or the Father of Saturn. The tilt of the axis of Uranus is approximately 90°. Thus, it looks like a rotating giant wheel, i.e. a planet on its side. It rotates on its axis from east to west. The planet appears greenish in colour. It has many rings and satellites that encircle it. Uranus is about four times the size of the Earth.

Uranus and Neptune was discovered after the invention of telescope. They are not visible with naked eye.

Neptune, the *Last Giant* is named after the Roman God of the Sea. It is quite similar to Uranus. It is greenish in colour. It is also made up of gas and has a system of rings. As it is farther away from the Sun, it is colder.

Satellite

Satellite is a celestial body that moves around a planet in the same way as the planets move around the Sun. All planets except Mercury and Venus have one or more satellites. These satellites like the planets, reflect light of the Sun and are visible at night. Our earth has only one satellite, i.e. Moon. Jupiter's satellite Ganymede is the largest satellite in the solar system. Earth's Moon is the sixth largest satellite in the solar system.

The Moon

The diameter of our Moon is only one-quarter that of the Earth. It appears so big because it is nearer to our planet than other celestial bodies. It is about 3,84,400 km away from us.

The Moon revolves (moves around) the Earth in 27 days and 8 hours. It takes exactly the same time to complete one rotation (spin on its axis). As a result, only one side of the Moon is visible to us on the Earth. In fact, the Moon is always **half dark** and **half bright** but the *angle of view from the Earth* keeps on changing. On the New Moon, the dark hemisphere of the Moon faces the Earth whereas on the Full Moon, its bright hemisphere is visible to us.

The Moon does not have conditions favourable for life. It has neither water nor air. It has mountains, plains and depressions on its surface. These cast shadows on the Moon's surface. We can observe these shadows while looking at the Full Moon.

Fact File

Uranus *rolls* along its orbit unlike other planets that *spin* like tops.



Uranus

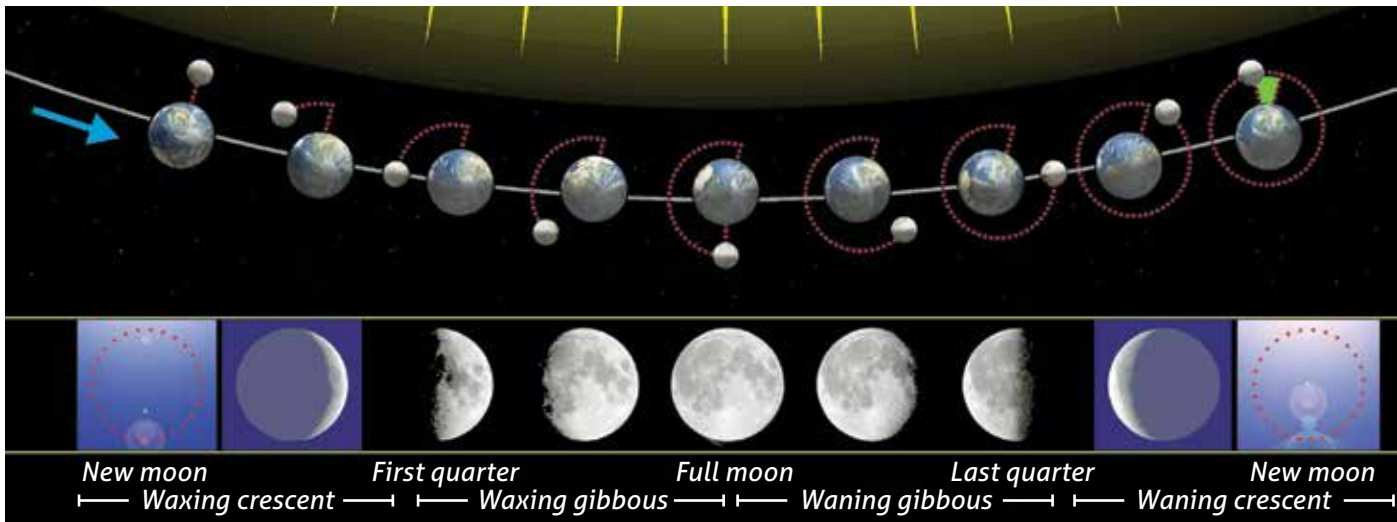


Neptune

Fact File

The footprints left by Apollo astronauts will not fade away or erode because there is no air or water on the Moon. Neil Armstrong was the first man to step on the surface of the Moon on 29 July 1969.

The temperature on the surface of the Moon reaches as high as 117°C at midday and falls to -162°C at midnight.



The phases of the moon

Human-made Satellite



Artificial satellite

Human-made satellite is an artificial body. It is designed and fabricated by scientists to gather information about the universe or for communication. It is carried by a rocket and placed in the orbit around the Earth. It revolves around the Earth just like the natural satellite Moon. It is called an *artificial satellite*. Some of the Indian satellites in space are INSAT, IRS, EDUSAT, etc.

Difference between Natural and Artificial Satellites

Natural Satellites	Artificial Satellites
1. These are naturally present in the space.	1. These are designed and fabricated by scientists and then sent to space.
2. These are naturally placed in their orbits.	2. These are placed in their orbits by powerful rockets called satellite launch vehicles.
3. These are comparatively far away from the Earth.	3. These are closer to the Earth.

The First Pluton (or dwarf planet) : Pluto

It was named after the Roman God of the Underworld. It is made up of solid rocky material. It looks as a small pale yellowish point when seen through a telescope. It is almost forty times farther from the Sun than the Earth. So, it is very cold. Its orbit is highly elongated and cuts through that of the planet Neptune. Its time for one revolution around the Sun is 247.68 years. Time for one rotation on its axis is 6.39 days.

Asteroids

Asteroids are small planet-like bodies which also move around the Sun. Each asteroid possesses its own orbit around the sun. Therefore, they are also called **planetoids** or **minor planets**. The orbits of all the

asteroids are spread over a long distance (more than 550 million km) forming a band called the **asteroid belt** that lies between the orbits of Mars and Jupiter. Out of over 1,00,000 asteroids, nearly 4000 have been identified. However, their total mass is not more than a few hundredth of the mass of the Moon. They are believed to be parts of a planet which exploded soon after its birth. The largest of these tiny planets is **Ceres** which has a diameter of 768 km.

Meteors or Meteoroids

The small pieces of rocks which move around the Sun are called **meteors** or **meteoroids**. Sometimes, these meteoroids come near the Earth and enter its atmosphere. Due to friction with the air the speeding meteoroids get heated up and burn. It causes a long flash of light. This flash is visible only at night. Burning meteoroids are also called as **shooting stars**. Sometimes, a meteor without being completely burnt, falls on the Earth and creates a hollow, such a meteor is called a **Meteorite**. Scientists get valuable information about the past history of the Earth and the solar system from the Meteorites.

Difference between a Star and a Shooting Star

Star	Shooting Star (meteor)
1. A star is a very huge mass of hydrogen and helium.	1. A shooting star is a small piece of rock.
2. Heat and light is produced because of fusion of hydrogen atoms into helium.	2. Heat and light is produced because of its friction with the atmosphere of the Earth.
3. Life– billions of years.	3. Life– a few seconds.

Galaxy

We can see a whitish broad band like a white glowing path across the sky on a clear starry night. It is a cluster of millions of stars. This band is called the **Milky Way galaxy**. It looks as if split milk, hence the name Milky Way. Our solar system is a part of this galaxy. In ancient India, it was imagined to be a pious river of light flowing in the sky. Thus, it was named **Akash Ganga**. A **galaxy** is a huge system of billions of stars and clouds of dust and gases, all gravitationally interacting and orbiting about a common centre. Galaxies vary in size and form– spiral, elliptical and irregular. Our galaxy Milky Way is spiral.

The closest galaxy to our galaxy is Andromeda which is 4 light years away.

Universe

We use the word **universe** to mean everything that exists in space. It is difficult to imagine how big the universe is. Scientists are still trying to find out more and more about it. There are billions of galaxies that make the universe. If drawn to scale our galaxy does not even get a point size in the universe! Similarly, our solar system does not even get a point size in our Milky Way galaxy drawn to scale. And our Earth hardly gets a point size in our solar system drawn to scale! Also our city hardly gets a point size on our Earth drawn to scale!



The milky way galaxy side view



The milky way galaxy top view



Fact File

The Italian astronomer, Galileo Galilei was the first person to study the sky with a telescope.





Key Words

- » Celestial bodies : the Sun, the Moon, and all those objects shining in the night sky.
- » Stars : the celestial bodies which have their own heat and light.
- » Constellations : a group of stars in a particular shape.
- » Planets : the celestial bodies which don't have their own heat and light.
- » Revolution : moving of a small body round a big body in space in a fixed orbit.
- » Rotation : spin of a body on its axis.
- » Satellite : a natural or artificial body which moves round a planet.
- » Asteroids : small rocks revolving round the Sun in their own orbit.
- » Meteoroids : small pieces of rocks that enter the Earth's atmosphere from space.
- » Galaxy : clusters of billions of stars.
- » Light year : the distance travelled by light in one year.
- » Orbit : the path on which the planets revolve around the Sun.

SUMMARY

- ▶ The Sun, The Moon and all those objects shining in the night sky are called celestial or heavenly bodies.
- ▶ The stars are very huge balls of burning gases emitting out a lot of heat and light.
- ▶ Groups of bright stars in the sky that form characteristic patterns of shapes and appear to move together are called constellations.
- ▶ The planets are the shining objects that travel through the sky without twinkling. They do not have their own heat and light.
- ▶ The Sun is our nearest star.
- ▶ The Sun, eight planets, three plutons, satellites, asteroids and meteoroids form the solar system.
- ▶ There are eight planets in our solar system– Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- ▶ The planets revolve round the Sun once in less than 200 years in near circular orbits.
- ▶ The plutons take more than 200 years to revolve once round the Sun in highly tilted orbits.
- ▶ Mercury, nearest to the Sun is also the hottest planet and Neptune the farthest is also the coolest planet in the solar system.
- ▶ Satellite is a celestial body that moves around a planet in the same way as the planets move around the Sun.
- ▶ Human-made or artificial satellites, designed and fabricated by scientists are carried by a rocket and placed in the orbit around the Earth to revolve.
- ▶ Asteroids are small planet-like bodies which also move around the Sun in their own orbits.
- ▶ The small pieces of rocks which move round the Sun are called meteoroids. When they enter the Earth's atmosphere, they get heated due to their friction with the air and burn. At night we call these burning meteoroids as 'shooting stars'.
- ▶ A galaxy is a huge system of billions of stars and clouds of dust and gases.
- ▶ There are billions of galaxies that make the universe.

Exercise Time

A. Tick (✓) the only correct choice amongst the following :

- Ursa Major is a :
a. star b. constellation c. satellite d. planet
- The Pole Star indicates the direction to the :
a. South b. West c. North d. East
- Which of the following is not a member of the solar system ?
a. asteroids b. satellites c. constellations d. plutons
- Which is the third nearest planet to the Sun ?
a. Venus b. Earth c. Mercury d. Mars
- All the planets move around the Sun in a path which is :
a. elongated b. circular c. rectangular d. triangular

B. Fill in the blanks :

- Earth's satellite is called the _____.
- A huge system of the stars is called _____.
- Stars have their own and _____.
- A group of stars forming various patterns is called a _____.
- A celestial body that revolves around a planet is called a _____.

C. Match the following :

- | | |
|----------------------|------------|
| 1. Red planet | a. Jupiter |
| 2. Blue planet | b. Saturn |
| 3. The Giant planet | c. Mars |
| 4. The Jewel planet | d. Venus |
| 5. The Veiled planet | e. Earth |

D. Write true (T) or false (F) against the following statements in given brackets :

- All the planets move around the Sun from West to East.
- The outer planets are also called the terrestrial planets.
- Jupiter is the smallest planet in size.
- Venus and Uranus rotate from East to West.
- The Sun is the only star in our solar system.

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E. Define the following terms :

- | | | | | |
|--------------|---------------|---------------|--------------|-------------------|
| 1. Star | 2. Planet | 3. Galaxy | 4. Asteroids | 5. Meteorite |
| 6. Satellite | 7. Light year | 8. Revolution | 9. Rotation | 10. Constellation |

F. Identify the following :

- | | | | |
|-------------------------|-------|----------------------------|-------|
| 1. Earth's twin | _____ | 6. Veiled Planet | _____ |
| 2. Jewel Planet | _____ | 7. Largest planet | _____ |
| 3. Ruler of Roman Gods | _____ | 8. Planet with life | _____ |
| 4. Jupiter's father | _____ | 9. Evening Star | _____ |
| 5. Roman God of the sea | _____ | 10. The planet on its side | _____ |



G. Differentiate between :

1. Star and Planet
2. Natural Satellite and Artificial Satellite
3. Star and Shooting Star
4. Constellation and Galaxy
5. Revolution and Rotation
6. Asteroids and Meteoroids

H. Answer in one word or one phrase :

1. Between whose orbit the asteroid belt is found ?
2. Which is the closest celestial body to our Earth ?
3. What is the celestial body that appears to change its position with respect to the stars ?
4. What is the temperature on the surface of the Sun ?
5. How much time does sunlight take to reach the surface of the Earth ?

I. Answer these questions briefly :

1. What is meant by the 'Solar System' ?
2. Name all the planets according to their distance from the Sun ?
3. Why is the Earth called a unique planet ?
4. Why do we see only one side of the Moon always ?
5. What are the factors that make life possible on Earth ?
6. Arrange the planets according to their size.
7. Name the planets which have rings around them.
8. Why the sun is very important for our Earth ?
9. Why can't the Moon support any form of life ?
10. Why do the planets not twinkle like the stars ?

J. Answer these questions in detail :

1. What is a constellation ? How it is different from a galaxy ?
2. Is the Sun a star or planet ? Discuss.
3. Describe the Earth in some detail.
4. Why is the Sun considered to be the centre of the solar system ?
5. Why do we always see the same face of the Moon ?

PROJECT WORK

1. Prepare a chart/diagram of the solar system showing the relative sizes of the planets.
2. Make diagram of some important constellations.
3. Visit a planetarium and describe your observations.