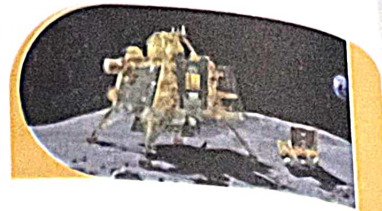


3. Salt is a/an soluble tablets in water to drink



# 9

## The Solar System

### LESSON

### Learning Outcomes

After completing this chapter, students will be able to:

- define universe, solar system, stars, the Sun, satellites, other heavenly bodies, rotation and revolution
- identify the eight planets of the solar system
- describe structure and movement of the Earth
- explain how day and night occur and how seasons change

### Inside the Chapter

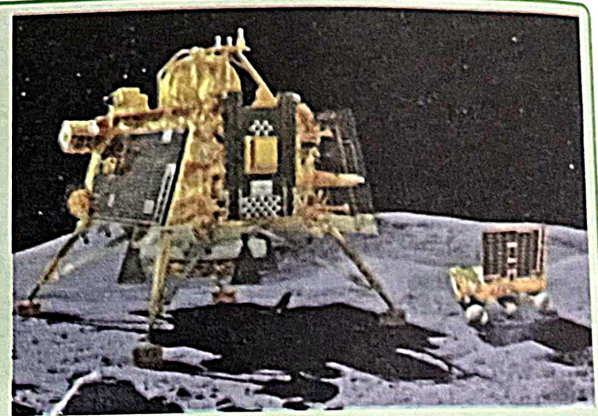
★ The Universe ★ The Solar System ★ The Stars ★ The Sun ★ The Planets ★ The Earth

### Let's Do

**Chandrayaan-3:** India has made history by becoming the first country in the world to soft land on the moon's **South Pole** on **23<sup>rd</sup> August 2023**. The moon's **South Pole** is a region that has never been explored. **India** becomes the fourth country after **United States, Russia and China** to successfully land on the moon.

Let's answer now—

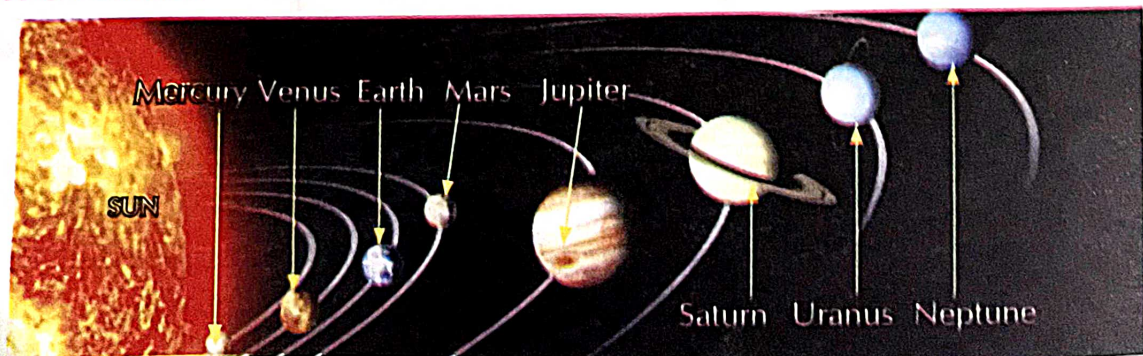
- Chandrayaan-3 was launched on July 14, 2023
- Name the Space Agency of India that launched Chandrayaan-3. Indian Space (Pride in India)



### THE UNIVERSE Research Organisation (ISRO)

The vast space that we see when we look up at the sky and everything in it is called the **universe**. It includes all the heavenly bodies like the stars, planets, satellites, meteoroids and comets.

### THE SOLAR SYSTEM



Solar system



3. Salt is a/an salt.

7.	Uranus	Arun	27	Third largest planet, <b>gaseous planet</b> (has methane gas in the atmosphere which gives it blue-green colour)
8.	Neptune	Varun	14	<b>Coldest and farthest planet</b>

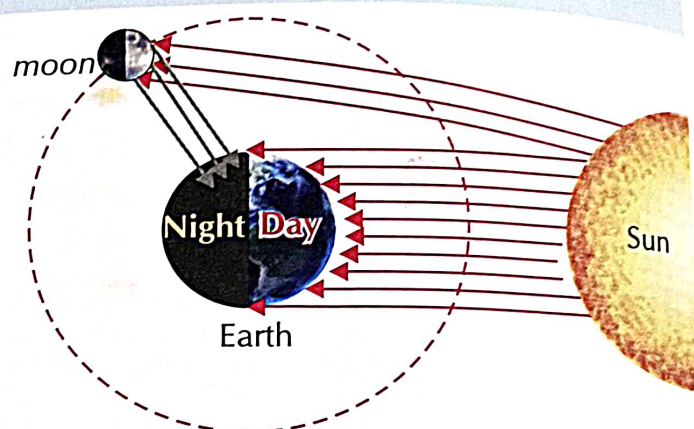
Source: solarsystem.nasa.gov  
Accessed on: 08/08/2023

Remember this mnemonic to learn the sequence of planets in the solar system: **My Very Educated Mother Just Served Us Noodles.**

Till August 2006, Pluto was also considered a planet. However, in a meeting of the **International Astronomical Union (IAU)**, a decision was taken that Pluto is like other celestial objects (Ceres, Haumea, Eris) and is to be categorised as a '**dwarf planet**' or '**plutoid**'.

## SATELLITES

They are the small heavenly bodies that **revolve around a planet**. Some planets have their own satellites. The moon is the natural satellite of the Earth. It has no light of its own. It shines because it reflects the light of the Sun.



A satellite (moon) reflects the sunlight.

(NEP GUIDELINES)

## Think Beyond (Critical Thinking)

There are some other heavenly bodies that revolve around the Sun between the orbit of planets. Research about them and share your findings with your friends.

## Multiple Choice Questions

Tick (✓) the correct answers:

(Remembering, Analysing)

1. Which of these give out their own light?

(a) stars

☒ (b) planets

☐ (c) moons

2. The table given alongside shows the position of planets in our solar system. Identify the planets P, Q, R and S. Which one of the following columns shows the correct order of planets?

(a) A

☐ (b) B

☐ (c) C



The diagram shows the Sun at the center, represented by a large circle labeled 'SUN'. Four concentric elliptical orbits are shown around the Sun. Planet P is on the first orbit, Planet Q is on the second orbit, Planet R is on the third orbit, and Planet S is on the fourth orbit. The planets are labeled with their respective letters next to them.

	P	Q	R	S
A.	Mars	Jupiter	Neptune	Saturn
B.	Mercury	Mars	Jupiter	Uranus
C.	Mercury	Earth	Jupiter	Saturn



2. We add Chlorine to it.
3. Salt is a/an salt.
4. ...

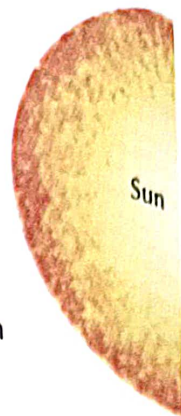
**Revolution:** The movement of the Earth around the Sun is called revolution. The Earth takes about 365 days and 6 hours to complete one revolution. This time period is called a **solar year**. **Revolution of the Earth causes seasons.** At a certain time, seasons vary in regions above and below the equator of the Earth.

### Days and Nights

The part of the Earth facing the Sun receives the sunlight and has day. The other half of the Earth that is away from the Sun does not receive any sunlight and is in darkness. So, it has night. **As the Earth rotates, different places move near or away from the sunlight. This causes day and night. The Earth rotates from west to east on its axis. So, the Sun appears to rise in the east and set in the west.**



The rotation of the Earth causes day and night.



### Multiple Choice Questions

Tick (✓) the correct answers:

1. An imaginary line that passes through the centre of the Earth from the North Pole to the South Pole is called the
 

☐ (a) equator

☐ (b) hemisphere

☐ (c) axis
2. Why is the Earth the only planet that supports life?
 

☐ (a) because the Earth is blue

☐ (b) because the Earth has one moon

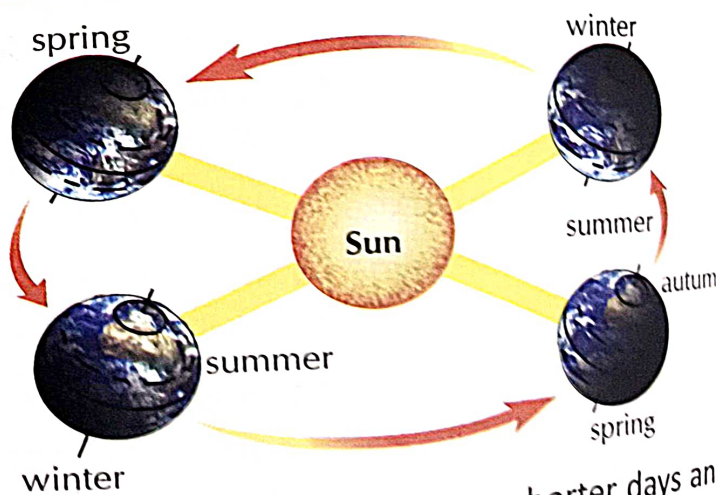
☒ (c) because the Earth has oxygen and water

(Remembering, Understanding)

### Seasons

The Earth revolves around the Sun. However, during its revolution, the Earth always remains tilted on its axis. The area (hemisphere) which is towards the Sun gets the direct sun rays, so it is warmer. It has longer days and shorter nights. It has summer. At the same time, the other area (hemisphere) that is away from the Sun, gets slanting sun rays, so it is cooler. It has shorter days and longer nights. It has winter.

For example, when it is summer in India, Brazil has winter.





Competency Based Discussion:

What will happen if the Earth stops rotating?

... are responsible for change in seasons in different

## Exercise

[According to NEP Guidelines]

### SECTION - A

#### A Oral Questions:

1. Define universe.
3. What are satellites?

2. Why do we see stars mostly at night? (Remembering, Understanding)

#### B Science Riddles:

1. I am a big round ball up high, to me no one can fly. Day and night, I give you light, without me, it would be dark as night. Who am I? *Sun*
2. I am the closest planet to the Sun, with a fiery surface, you should run! My name starts with the letter "M", can you guess which planet it could be? *Mercury*

(Problem Solving)

#### C Multiple Choice Questions:

Tick (✓) the correct options.

(Remembering, Understanding, Logical Thinking)

1. The planet now known as dwarf planet is  
(a) Mercury ☐ (b) Pluto ☐ (c) Mars ☒
2. The seasons on the Earth are caused due to  
(a) the Earth's rotation and revolution ☐  
(b) the Earth's revolution and the tilt of the axis ☒  
(c) the Earth's rotation and the tilt of the axis ☐

3. How many times does the Earth rotate on its axis in one day and one night?  
 (a) Once ☒ (b) Twice ☐ (c) 365 times ☐

**D Case/Source based Questions:**

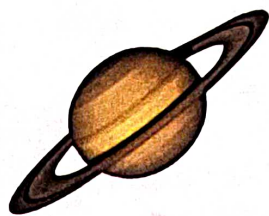
Read the situation given below and choose the correct answers: (Applying)  
 Ankit sees a big bright object in the sky at night through a telescope. His father tells him that this bright object in the sky is the largest planet. It has the greatest number of moons.

1. Which one of the following planets does Ankit spot?  
 (a) Neptune ☐ (b) Jupiter ☒ (c) Saturn ☐  
 2. The closest planet to Jupiter is  
 (a) Earth ☐ (b) Venus ☐ (c) Mars ☒

**E Fill in the blanks with the help of given words:**

1. The Moon is the natural satellite of the Earth. (Remembering, Understanding)  
 2. Mercury is the smallest planet. (Sun/moon)  
 3. The Earth rotates from west to east on its axis. (Venus/Mercury)  
 4. Places getting slanting sun rays at certain time of the year have winter. (east to west/west to east)  
 (winter/summer)

**F Observe the following pictures and write their names in the blanks provided:** (Remembering)



1. Saturn



2. Jupiter



3. Earth

**SECTION - B**

**A Very Short Answer Questions:**

1. What are stars?  
 2. Which planet is closest to the Sun?  
 3. Define solar system.

(Remembering, Understanding)

**B Short Answer Questions:**

1. How many types of movements does the Earth have? Give one effect of each  
 2. Moon is not a star, still it gives us light. How?

(Remembering, Understanding, Analysing)



# Chapter - 9

## The Solar System :-

### Section - B

A. Very short Answer Questions :

1. What are stars ?

Ans Stars are twinkling lights on the night sky. They are very far away and are much bigger and brighter than tiny dots we see.

2. Which planet is closest to the sun ?

Ans The planet closest to the sun is Mercury.

3. Define Solar System ?

Ans The solar system is like a big family of the sun, planets, moons, and other things that go around the sun. OR

The sun, the eight planets and their satellites (moons), and other heavenly bodies like comets and asteroids form the Solar System.

B. Short answer Questions :-

1. How many types of movements does the earth have ? Give one effect of each.

The Earth shows two types of movements -

(a) Rotation :- The effect of Rotation of the Earth causes day and night.

(b) Revolution :- Revolution of the Earth causes seasons.

2. Moon is not a star, still it gives us light. How ?

Ans The moon is not a star. It shines because it reflects the sun's light, when sun's light falls on the moon.



3. Differentiate between rotation and revolution of the Earth? List two differences.

### Rotation

(i) Rotation is Earth spinning around its own axis.

(ii) It takes about 24 hours for one complete rotation.

### Revolution

(i) Revolution is Earth moving around the Sun in a big <sup>circle</sup> ~~cycle~~.

(ii) It takes about 365 days for one complete revolution.

4. Why does the Sun appear to rise in the east and set in the west?

Ans The Sun appears to rise in the east and set in the west because Earth rotates from west to east. So, as Earth turns, it seems like the Sun is moving across the sky.

Q The Sun is also a star but it looks very big as compared to the other stars. Why?

Ans The Sun looks bigger than other stars because it is much closer to Earth. Stars are really far away, but the Sun is relatively close. That's why it seems bigger and gives us more light and heat.



### C. Long Answer Questions:-

1. (a) Observe Fig. A. Now, label the diagram (P, Q, R, S) of the structure of the Earth.

(b) Describe the three layers of the Earth.

Ans (a) Crust (P) (b) Mantle (Q) (c) Inner core (S) Outer core (R)

Ans The Earth has three main layers:-

• Crust:- The outermost layer. It contains the continents and oceans.

• Mantle:- A thick layer beneath the crust, mostly composed of solid rock that can flow like a slow liquid over long periods.

• Core:- Outer core:- Made of liquid iron & nickel  
Inner core:- composed of solid iron & nickel due to high pressure.

2. What causes day and night? Explain with the help of a diagram.

Ans Day and night are caused by Earth's rotation on its axis. As Earth rotates, different parts face the Sun, causing day where it's illuminated by sunlight and night on the side facing away from the Sun. See the diagram below.



3. What would happen if there would be single season on the earth?

Ans. If Earth had only one season, it would lead to extreme and uniform weather conditions globally. Regions would not experience the variety of climates and temperature changes associated with different seasons. This lack of diversity could impact ecosystem, agriculture and the overall balance in nature, affecting life on Earth.