

*Cosmo School*  
**Chapter -8**  
**The Universe**

**Telescope:**

A telescope makes far away objects seem larger. It helps us see farther into space. Scientist uses telescope to research on planets, stars and galaxy.

**Planet: (2016)**

Planet is a large natural body that revolves in an orbit around the sun.

**Star:**

A very large ball of burning gas in space that is usually seen from the earth as a point of light in the sky at night.

**Galaxy:**

A galaxy is a group of many stars with gas, dust and dark matter. The name of our galaxy is milky way.

**1. The universe and the earth**

**A. Size of universe:**

*Q1: How big is the universe?*

**Ans:** It is very difficult to say how big the universe is. Because the universe is expanding all of the time. The universe is so big that even light hasn't had time to cross it in nearly 14 billion years.

*Q2: How fast can light travel?*

**Ans:** Light can travel at approximately 3,00,000 km a second.

*Q3: How long light takes to travel from the moon to the earth?*

**Ans:** The distance from the moon to the earth is 3,84,400 km. So, light takes about 1.3 second to travel from the moon to the earth.

*Q4: How long light takes to travel from the sun to the earth? (2016)*

**Ans:** A distance from the sun to the earth is 15,00,00,000 km. Light takes about 8 minutes to travel from the sun to the earth. This means that we always see the sunlight that is emitted from the sun about 8 minutes ago.

*Q5: What is the milky way?*

**Ans:** Milky way is one of the galaxies in the universe.

*Q6: If we able to travel as fast as light how many years it would take to cross the milky way?*

**Ans:** If we were able to travel as fast as light it would take 1,30,000 years to go across the milky way galaxy.

*Q7: How many stars a galaxy has?*

**Ans:** According to the Sir Eddington a galaxy has approximately ten thousand crores of stars.

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*Q8: What is astronomy?*

**Ans:** Astronomy is the study of the universe such as stars, planets and space.

*Q9: Why do scientist use telescope? (2018)*

**Ans:** Scientist use telescope to research on planets, stars and galaxy.

*Q10: Which device will you to observe the stars in the sky? (2017)*

**Ans:** Scientist use different technologist such as telescope to study the universe. They also building a spacestation to study the universe.

*Q11: Who invented telescope and why?*

**Ans:** Galileo invented and improved telescope that allowed him to see far into space. Using the telescope, he proved that the planets actually revolved around the sun. Scientists are now using space telescopes and are building a space station to study the universe.

**Motions of earth:**

*Q12: What are the two motion of earth? (2018)*

**Ans:** The two motion of earth are:

a. Diurnal Motion

b. Annual Motion

*Q13: What is called orbit?*

**Ans:** The path that earth and other planets move around the sun is called orbit.

*Q14: What is called revolution? How long does the earth take to complete one trip around the sun?*

*Or*

*What is called the annual motion of the earth?*

**Ans:** The orbital motion of the earth around the sun is called revolution. Revolution motion takes 365 days 6 hours for the earth to complete one trip around the sun. It is also known as the annual motion of the earth.

*Q15: What is called earth rotation? (2018)*

*Or*

*What is called the Diurnal motion?*

**Ans:** While revolving the sun, earth also spins or rotates on its axis like a spinning top. The spinning motion of the earth or its axis is called earth's rotation. It is also known as diurnal motion of the earth.

*Q16: What is the accurate time of earth's rotation?*

*Or,*

*How can we measure a day?*

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*Ans:* Earth's rotation takes 23 hour and 56 minutes for the earth to complete one full rotation on its axis, which is measured as on day.

*Q17: What is called axis?(2016)*

*Ans:* An axis is an imaginary line through the center of an object. Earth's axis goes through the center of an object. Earth's axis is tilted at some degree.

## **2. Day and Night + Sunrise and Sunset:**

*Q18: What causes day and night?*

*Ans:* Earth's diurnal motion causes day and night. It takes 24 hours to complete one full rotation on its axis.

*Q19: What is called day?*

*Ans:* The part of the earth that is facing the sun is called day.

*Q20: What is called night?*

*Ans:* The part of the earth that is facing away from the sun is called night.

*Q21: Write three sentences of why the sun seems to move from east to west across the sky? (2018)*

*Ans:* The sun seems rising in the east in the morning, and then sets in the west as the day ends. This is because the earth is spinning on its axis from west to east. As Earth rotates, the sun appears to move from east to west across the sky.

## **3. Season (summer + winter)**

*Q22: How many seasons we have? What are they?*

*Ans:* We have six seasons in a year. They are: Summer, Rainy, Autumn, Late Autumn, Winter, Spring.

*Q23: Why we have different seasons?*

*Ans:* The earth revolves around the sun, different parts of the earth tilted toward or away from the sun. So, we can say that the tilted of earth's axis and its orbit around the sun causes seasons. When the northern hemisphere tilts toward the sun, it is summer there. In summer, the sunlight shines more directly on the northern half of the earth giving more energy. This causes the temperatures to rise and the period of day time to be longer. Opposite season occurs in the southern hemisphere and it is winter there.

*Q24: How does temperature rises in the summer? Write four sentences on how you will experiment with the cause of day and night in your classroom.(2018)*

*Ans:* In summer the northern hemisphere tilts toward the sun and the sunlight shines more directly on the northern half of the earth giving more energy. This causes the temperatures to raise the period of daytime to be longer.

I will put a torch in front of a revolving globe in a dark room. Then I will shine the torch on the globe. If the torch is the sun and the globe is the earth than by revolving the globe anti clock wise we will see that when the torch light falls on a certain part of globe it is day there and night in the opposite area. So, we find that the rotation of globe that is the earth is the cause of day and night.

*Q25: How does temperature decrease in the winter?*

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**Ans:** In winter the northern hemisphere tilts away from the sun so the sunlight hits this part of the earth less directly. As a result the temperature is lower, and the period of day time is shorter by the period of night gets longer.

#### 4. The phases of the moon (Motion of the moon+ The moon in rotation)

*Q26: What is the moon? Write something about the motion of the moon.*

**Ans:** The moon is the only satellite of the earth. The moon rotates on its axis once every about 28 days and it also moves around the earth once every about 28 days.

*Q27: What is called satellite?*

**Ans:** A satellite is an object that revolves around a planet. The moon is the only satellite of the earth.

*Q28: How moon lighted by the sun?*

**Ans:** The moon is the only satellite of the earth. The moon does not produce its own light. It only reflects the sun's light. Half of the moon is always lighted by the sun. but as the moon orbits around the earth, the area of the lighted side facing the earth changes. These changes cause the phases of the moon. We can only see the lighted part of the moon.

*Q29: What is full moon?*

**Ans:** When we can see full of the side lighted, this is a full moon. In this phase earth is located between the sun and the moon.

*Q30: What is called new moon?*

**Ans:** When we can't see any of the lighted side, this is called a new moon. In this phases moon is located between the sun and the earth.

#### Fill in the blanks

1. A **telescope** makes far away objects seem larger.
2. Scientist uses telescopes to research on planets, stars, and **galaxy**.
3. Light takes about **1.3 second** to travel from the moon to the earth.
4. Milky way is one of the galaxies in the universe.
5. A galaxy has **ten thousand** crores the stars.
6. **Astronomy** is the study of the universe.
7. Galileo invented **telescope** that allowed him to see far.
8. Planets **resolved** around the sun.
9. Scientists are building a **space station** to study the universe.
10. Earth spins on its axis like a **spinning** top.
11. The spinning motion of the earth on its axis is called **rotation**.
12. Earth's **axis** goes through the north and south poles.
13. Earth's axis is **tilted** at some degree.
14. The earth's **rotation** causes day and night.
15. In the summer season the **northern** hemisphere tills toward the sun.
16. In winter the **northern** hemisphere tilts away from the sun.
17. The moon is the only **satellite** of the earth.
18. A satellite is an object that **resolves** around a planet.

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19. The moon does not produce its own light.
20. Half of the moon is always lighted by the sun.
21. We can only see the lighted side of the moon.
22. When there is summer in the northern hemisphere there is winter in the southern hemisphere.
23. Day and night occur due to rotation of the earth.
24. The period of earth's rotation is 23 hours and 56 minutes.
25. Light takes about 8 minutes to travel from the sun to the earth.
26. We always see the sun light that is emitted from the sun about 8 minutes ago.
27. The path that earth and other planets move around the sun is called orbit.
28. The period of revolution is 365 days and 6 hours.
29. The orbital motion of the earth around the sun is called revolution.
30. The distance from the moon to the earth is 384,400 km.
31. Light can travel at approximately 300,000 km a second.
32. The distance from the sun to the earth is about 150,000,000 km.
33. The changing shapes of the bright part of the moon that we see are called the phases of the moon.