



THE SUN AND THE PLANETS



As the weather was sultry in the night, Nithya and Radhika went to the terrace to sleep. Talking to each other, they looked at the magnificent night sky. "Oh! Look, how beautiful the sky is!" said Nithya.

Think and say

- ◆ Why did Nithya say that the sky was beautiful? Think.
- ◆ What do you see in the sky during night ?
- ◆ Are they visible during the day time ?
- ◆ What all do you see in the sky during day time?

Observe the following pictures



Picture-1



Picture-2

Group work



- ◆ Which picture depicts day time?
- ◆ Which one do you like more, the day or the night? Why?
- ◆ Apart from the sun, the moon and the stars, do you observe any other objects in the sky? Observe and tell.

10.1. The Solar system

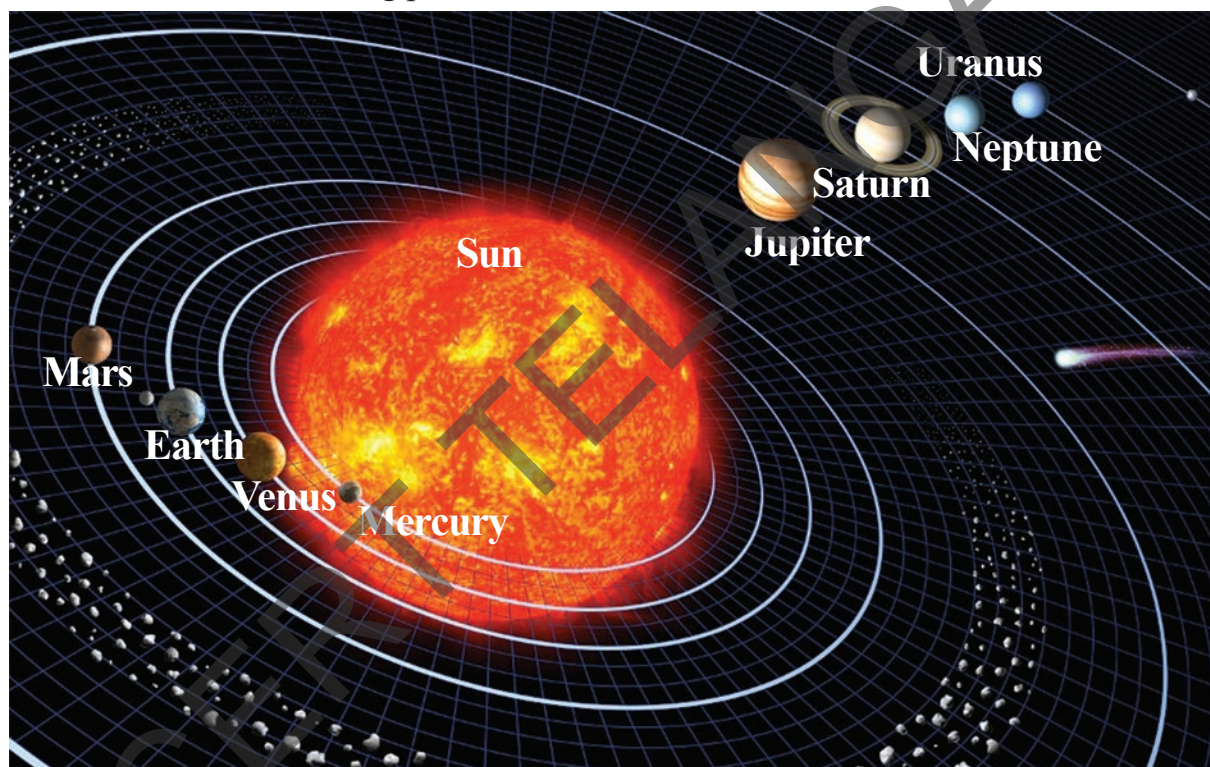
Besides clouds, the sun, the moon, and the stars, we have planets and the comets in the sky. Some of these can be seen easily but some cannot be seen. The stars which twinkle in the sky at night appear small because they are crores of kms., away from us. An aeroplane which can accommodate about 500 passengers, looks very small when it flies in the sky. Why? Think.

Do you know?

The sun is a star too. It is very near to the earth when compared to all the other stars in the sky. Hence, it appears very big. It constantly emits light and heat. The sun appears like a big burning ball of fire. The sun is the biggest star in the solar system. The sun's rays travel in all directions. It is the main source of energy in the solar system. Some portion of this energy in the form of light and heat reaches the earth's surface. The earth and the other seven planets revolve round the sun.

10.2. The Sun and the Eight Planets

Observe the following picture



Group work



- ◆ Which is the biggest object in the picture?
- ◆ When compared to the sun, what is the size of the earth? Which is the biggest planet?
- ◆ Which is the nearest planet to the sun?
- ◆ What is the position of the earth from the sun?
- ◆ Apart from the sun, what are the other shapes that you see in the picture? What are they called?

The objects that revolve round the sun are called the planets. The sun and the planets put together form the solar system. The Mercury, the Venus, the Earth, the Mars, the Jupiter, the Saturn, the Neptune, and the Uranus are the eight planets. These eight planets while rotating round themselves, revolve round the sun. Previously, we considered Pluto a planet. Hence, there are nine planets. But now, the scientists are not considering "Pluto" as a planet. The planets revolve round the sun in a particular path. This path is called an orbit.

Do like this



- ◆ Write the word 'sun' on one card and write the names of the eight planets on eight other cards.
- ◆ Place the cards on the table with their names facing down, and ask your friends to pick up one card each.
- ◆ Observe the pictures and arrange the cards that contain the names of the sun and the planets in their right order.

Think and say

- ◆ What is the position of Venus from the sun?
- ◆ Which is the biggest planet?
- ◆ Name the planets that lie on either side of the earth?
- ◆ Name the planet with rings around it?
- ◆ Name the farthest planet from the sun?
- ◆ Is Mercury hotter than the earth? Why?
- ◆ Which planet takes maximum time to revolve round the sun and which planet takes the least time?
- ◆ Whose orbit is bigger, the earth's or the Saturn's?

Do you know?

Don't look at the sun directly. It harms your eyes severely, if you do so.

10.3. Day, Night

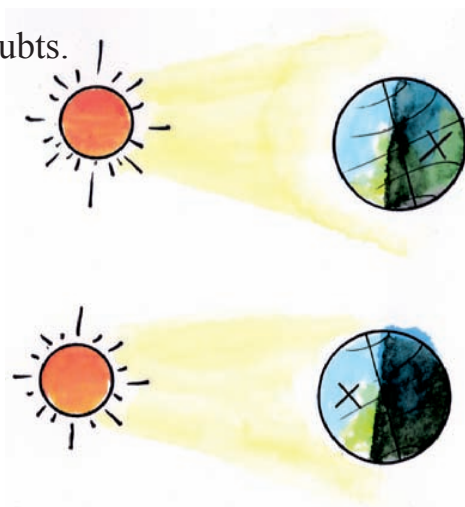
While looking at the sky, Nithya got some doubts.

- Why are nights dark?
- How are days and nights formed?

Look at the pictures given.

Think and say

- ◆ Observe the parts of the picture marked with 'x'.
- ◆ What difference do you observe in the part marked 'x'.



The earth is almost spherical in shape. Days and nights are occurred due to the rotation of the earth. The part of the earth which faces the sun is day and on the other side of the earth is night.

The movement of earth around its own axis is called "rotation". The earth not only rotates around itself, but also revolves round the sun. This is called "revolution".

The earth takes 24 hours to complete one rotation. The period of 24 hours is considered a day. The 24 hours in a day is divided roughly into 12 hours of day and 12 hours of night.

Think and discuss

- ♦ What is the position of the sun in the afternoon?
- ♦ It is very hot in the afternoon and comparatively in the morning and evening times. Why ?

The globe in your school is also in the shape of a sphere like the earth.

Do like this



With the help of your teacher, experiment in the dark room how days and nights are caused using a globe and a lighting candle. The side of the globe on which the light of the candle falls is day and its other side is night. A torch can also be used instead of a candle.

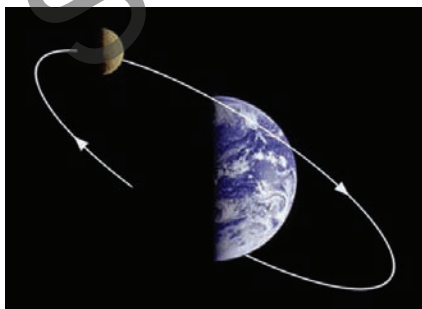
The sun rises in the east and sets in the west due to the rotation of the Earth. This can also be shown with the help of the globe and the torch. Focus the torch on the rotating globe for this activity.

Group work



- ♦ With the help of your teacher demonstrate the sun rise and the sun set using a globe.

10.4. The Earth - The Moon



The moon is the earth's natural satellite. A cosmic body which revolves round a planet is called a satellite. The moon revolves in a fixed circular orbit round the earth. It takes 28 days to complete one revolution around the earth. The moon is a non-luminous body and reflects the light of the sun

falling on its surface. When the moon rotates in its orbit, its illuminated half is towards the sun. The moon appears in different shapes as it rotates round in its orbit. Therefore, sometimes it appears small and sometimes big. Only on a full moon day we can see the entire moon, on other days only a part of it is visible. The moon takes 28 days to complete one rotation. Like the earth, the moon and the other planets also rotate round themselves. The moon revolves round the earth and the earth revolves round the sun.

Do like this



Observe the moon for one month and record your observations

- ◆ Was the moon round on all days?
- ◆ Which day does the moon appear as a full sphere?
- ◆ Why is the moon not visible on some days?
- ◆ Which day was the moon not seen at all?
- ◆ Name the festivals celebrated when the moon is seen in full and when it is not seen at all.

10.5. Shapes of the moon

When the moon is revolving round the earth it appears that the moon is changing its shape. It appears from the earth that moon takes its shape according to the changes in the absorption of sunlight by its surface.



Keywords

self luminous	comets	sunrise
stars	planets	sunset
orbit	satellites	revolution and rotation
cosmic objects	solar system	shapes of the moon



What have we learnt?



1. Conceptual Understanding

- Collect information about the solar system and write a note about it.
- Compare and contrast the objects that you observe in the sky during the day and during the night?
- Compare and contrast the sun and the moon?
- Compare and contrast the sunrise and the sunset?

2. Questioning and Hypotheses

- What happens if the earth does not rotate?
- What happens if there is no rainy season?
- What questions would you ask the people in the Meteorological Department to know about the atmosphere.

3. Experiments - Field Observations

- Take a bucket of water and stir it in a circular motion using your hand and observe how the water is moving.
- Observe the moon for a month every day, record your observations and discuss.

4. Information Skills, Projects

- Collect information regarding the time of sunrise and sunset for a week, and discuss the information gathered, with your classmates.
- Collect information on minimum and maximum temperatures for a week and discuss the information collected.
- Observe the sky for one week. Note down the number of days on which moon is seen in the sky and the duration for which it is visible? Draw the shapes in your notes.

5. Communication through Mapping Skills, Drawing Pictures and Making Models

- a) Draw a painting showing the sunrise.
- b) Prepare a model to show the night sky.
- c) Observe the moon for 15 days and make the different shapes of it using pieces of cardboard.
- d) Prepare a model of the solar system and display in the classroom.

6. Appreciation, Values and Creating Awareness towards Bio-diversity

- a) What kind of atmosphere at night makes you feel happy?
- b) What is the importance of sun in our lives?
- c) Why do some people worship the sun and the moon?
- d) Observe the sky at night and write your experiences.

I can do this

- | | |
|-------------------------------------------------------------------------------------|----------|
| 1. I can explain about atmosphere? | Yes / No |
| 2. I can tell the reasons for changes in the atmosphere. | Yes / No |
| 3. I can draw a diagram and explain how days and nights occur. | Yes / No |
| 4. I can draw the shapes of clouds, sky, sun and moon. | Yes / No |
| 5. I can analyse the information collected regarding sunrise and sunset for a week. | Yes / No |
| 6. I can prepare a model of the solar system and display in the classroom. | Yes / No |
| 7. I can say why the nights are dark. | Yes / No |
| 8. I can explain about the rotation of the earth. | Yes / No |
| 9. I can explain about the importance of sun in human life. | Yes / No |