



11

SKY (SPACE)

Dear student, in the last lesson you learned about fire protection in Vedas. In this lesson you will learn about the sky i.e. space. The sky is considered constant. The quality of the sky is shabd. Shabd quality is the eternal quality of the sky. In the proposed text, we will study many things related to space, such as - about the Sun, Moon and stars, the difference of stars and planets, the relationship between the Sun and the planets, the formation of day and night, etc.

**OBJECTIVES**

After reading this lesson you will be able to -

- get to know about space;
- To get to know about Sun, Moon, stars;
- To understand the difference between stars and planets;
- To know the relationship between the Sun and the planets;
- Understanding of night and day; And
- understanding the change of seasons.



11.1 SKY (SPACE)

The sky is very large. It is wrapped around our earth. When we see it with our eyes we see blue color. In Vedic culture it is called 'open space' or a place that is void. It is one of the great five elements. If we look at the expanse of the sky, from the atmosphere around the earth, it is infinite. All the weather events like rain, storm etc. occurs in this atmosphere. All the planets, satellites, solar system and much Akash(sky) Ganges are found in space extending beyond the same atmosphere.



Fig. 11.1 Open Space

Our Akash(sky) Ganga is one of these many Akash (sky) Ganges spread in space. Our solar system is located in this. We also know Akash (sky) Ganga as 'Kshir Sagar' and in English it is called 'Milky Way' i.e. 'River of Milk'.



Fig. 11.2 Akash (sky) Ganga

11.2 OUR SOLAR SYSTEM AND THEIR RELATIONSHIP

The sun, moon and stars have a very important role in people's life. In the absence of these, life of humans is not possible. People of the older generation thought about them in different ways. It was believed that our earth remains fixed and the sun moves. It rises in the morning and sets in the evening. Later it was discovered that the Earth revolves around the Sun on its axis, while the Sun remains still at one place. Days and nights are

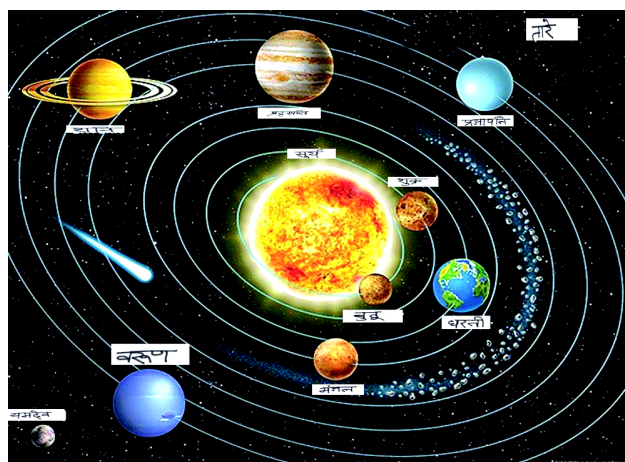


Fig. 11.3 Our Solar System



formed only when the earth revolves around the sun. Like the earth, the moon also rotates.

The moon revolves around the Earth. In this way, nature and human life have been created by the interconnection of the sun, moon, earth and stars. Civilization and culture have evolved and developed from them.

Let us now try to understand the solar system through the interaction of teachers and students.

When sir entered a class, he had a globe in his hand. He started observing it very carefully.

Sir asked- "Children, do you know what is in my hand?"

"Yes sir, it is a globe. We have seen this many times, it is placed on the table of the Principal", the children answered in one voice.

"You know, why I brought it to the class today?" sir asked.

"You must have brought to teach us geography today," Radha replied immediately.

"Exactly, today I will give you information about the solar system i.e. Earth, Sun, Moon and stars, "sir said.

"What is this solar system, sir?"Gopal asked.

"Now everyone tell! Well, everyone must have seen the sun, moon, earth and stars! "sir asked.



Fig. 11.4 Globe



"I see many stars on the roof every day before sleeping. I try to count them as well", Vivek said.

"So everyone has seen the sun, moon and stars?"

"Yes, sir, see it every day," the children said.

"Then everyone must have also heard about planets, satellites and constellations," sir asked.

"Yes, sir, but don't know what this is all about?" Two or three children spoke together.

"Together they are called the solar system. Today I will teach about it."

Sir raised the globe and showed it to everyone - "Our earth is round like this and it rotates in this way, tilting on its axis."

Saying this, he moved the globe by hand.

"Sir, what is the relationship between the Earth and the Sun?"

Aristina wanted to know.

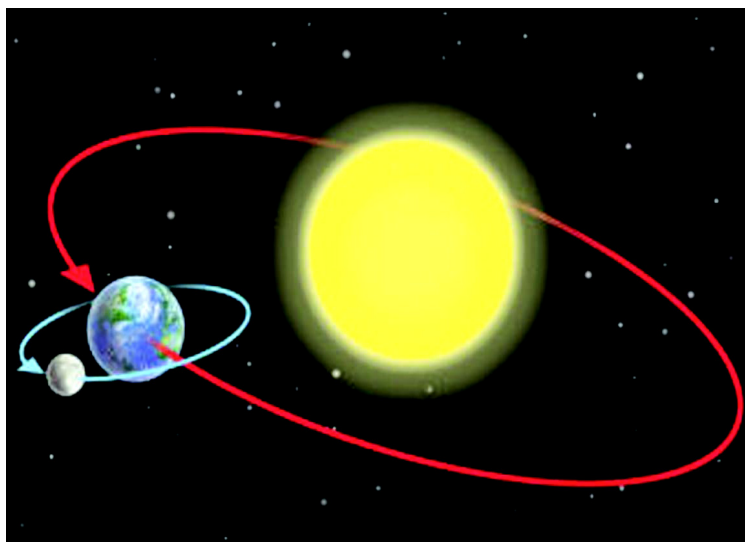


Fig. 11.5



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"You know that we all live on Earth. So far there is no evidence of life on any other planet has been found. It is believed that the Earth is broken by the sun.

The Sun is a large circle of fire and gases. It shines continuously with its light, that's why it is considered a star, "said sir.

"Sir, why a star? The sun is the sun, not the star," Aristina interrupted.

"One who shines with its own light is called a star. The one who receives its light from the star is called the planet. Therefore our earth is the planet, because it receives its light from the sun. As I said earlier it is round. It rotates from east to west on its tilted axis. Along its axis, it also rotates around the Sun. It also revolves. This revolution of the Earth is completed in 365 days. . "

"Does only the Earth revolve around the Sun, sir?" Gopal asked.

"No, there are seven more planets besides Earth - Mars, Mercury, Jupiter, Venus, Saturn, Uranus and Neptune, which revolve around the sun. Earlier Pluto was also considered a planet. Now some scholars do not consider him a planet. All these planets get their shine only from the sun. The bodies that orbit(revolve) around these planets are called satellites. We can call them the Sun's own family. These all together are called the Solar System, "sir explained in detail.

"Well, those who orbit(revolve) the Sun, get light from it, the planets, and the planets that revolve around satellites, "Gopal said.

"Got it all right."

"Do satellites revolve around the Earth as well?" Arstu asked.



"Only one satellite orbits (revolve) the Earth. It is called the moon. By the way, many satellites also revolve around other planets. Like Mars have 2 satellites, 8 of Neptune, 23 "Because the moon revolves around the earth, that's why it is also seen by us, sometimes hiding and moving out.

But sir, why is there a difference in its size? Sometimes it looks like a plate; sometimes it is incomplete like a laugh. It also keeps on increasing-decreasing, "Radha asked.

"Yes, it keeps on increasing-decreasing. When it starts decreasing it is completely hidden, then there is Amavasya(lunar phase) and when it shines completely in the sky, that night is the full moon night. The journey from Amavasya(lunar phase) to Purnima(full moon) takes fifteen nights. This movement of the Moon is called the phases of the Moon. There are two phases of 15-15 nights - Shukla Paksha and Krishna Paksha. The dates of the Indian calendar are based on these.



Fig. 11.6



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"You must have also seen that many stars flicker in the sky. There are many stars in them, which are much larger than the Sun in their size," sir said.

"Then why do they appear so small, sir?" Vivek asked.

"Because, they are at a much higher distance from our Earth than the Sun. You know that a distant object appears small. These groups of stars are called constellations. "

"Then there must be many groups of them sir," Vivek asked.

"Is there a group of seven stars along the pole star (Dhruva tara)." Radha questioned.

"Yes, it is right that the pole star in the north direction remains in a stable position and near those seven stars there is a cluster of stars, which is named as Sapta Rishi," sir told.

"Sir, sometimes a white milky way of star appears in the sky, what is that?" Arstu asked.

"It is called Akash Ganga(milky way). Sometimes, the shooting star also appear in the sky," sir explained, then said-" All our planets, satellites, constellations and stars etc. revolve in space, ie the sky. Space means the sky, which has no end, thus you know that all the planets including the earth rotate in the sky, so they cannot rest on anything.

- The sun, the earth, the moon, etc. makes up the solar system.
- The sun is a star in the solar system. It shines with its own light.



- Earth receives sunlight in the solar system. That's why earth is called a planet.
- Moon is the satellite of our Earth. It revolves around the earth.
- Like the moon, other planets also have satellites, which revolve around them.

**INTEXT QUESTIONS 11.1**

1. What are the names of the planets in the solar system?
2. What is the difference between stars and planets?
3. Where does the Earth revolve?
4. From whom do satellites receive light?

11.3 DAY AND NIGHT OCCURRING

"Sir you just told us that the Sun is a star, so why doesn't it show up at night? The stars shine at night don't they?" Raju asked.

"You know that, we live on earth. The sun rises from the east and sets in the west." sir said.

"Wow! Who doesn't know this! I know it too," Gopal replied.

"Then now must have know the truth that the sun does not actually go anywhere, nor does it come from anywhere. It neither rises nor sinks. It keeps shining in the same place. It shines with its spreading light,"sir said while giving information.

"But we see the sun rising and sinking," Gopal said, disagreeing.

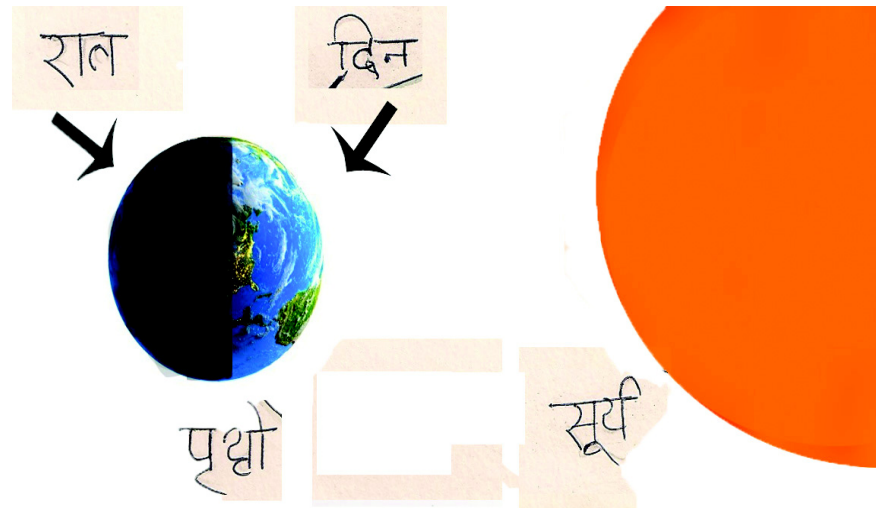


Fig. 11.7

"Well, I have also told you that the earth is round like a globe. It also revolves around the sun rotating on its tilted axis," sir reminded.

"What happens with this, sir?"

"This is the reason why the sun rises and appears to be sinking. That is why night and day are made. I have told you that the sun shines steadily at one place. The part of the earth that is exposed to the sun is filled with sunlight. The light which falls on the part of the earth there the day comes out," sir said, placing a part of the globe in front of the lighted bulb -

"Look, the part of the globe which is In front of this bulb is shining with light, while the shadow of the bulb is seen on the back of the globe. Thus, the light does not reach this back part. "

"Meaning, the part which is hidden behind, has no light. It is considered night there," Gopal said.



"Exactly, the Earth rotates on its axis in 24 hours. This forms night and day. That is, the part of the Earth that faces the Sun, there are days. Likewise, in the rest part, the night occurs. Thus, it is 12 hours a day and 12 hours a night. Seven days are there in a week. The days of the week are also named according to these constellations.

"Sir; Tuesday, Wednesday, Thursday, Friday and Saturday are the names of the planets, but on what basis are the names Sunday and Monday?"

"Why, don't you know that the Sun itself is called Ravi, it is named after Sunday? The Moon also has a name Som, so a day is named as Monday."

11.4 FORMATION OF SEASONS

"The day and night occur by rotation of the earth and the sun; likewise, the seasons occur by rotation."

"How is that sir?"

"This revolution of the earth is completed in 365 days. 7 days in a week, 30 days in a month and 365 days in a year"

"But, you were talking about how seasons occur?" Vivek said, interrupting in the middle.

"Yes, the distance between the Sun and the Earth is different during this orbit (revolution). The part of the Earth which is closest to the Sun is affected by the heat which results to summer season. The part which is away, winters occur there. Due to the rotation of the cycle of seasons is formed. "

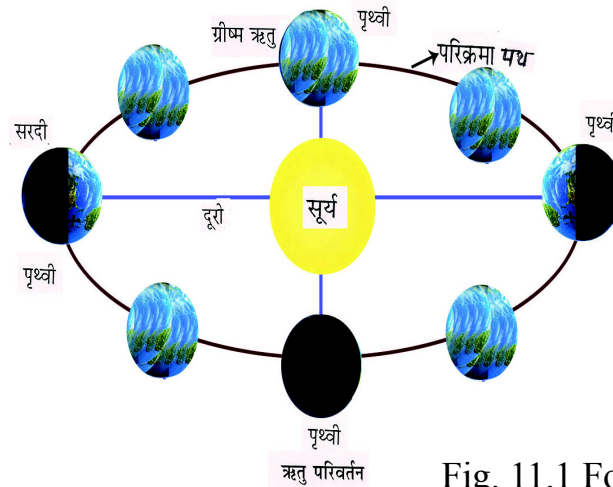
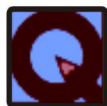


Fig. 11.1 Formation of Seasons

"This way there should be only two seasons." Gopal expressed doubt.

"The temperature of the Earth changes due to the increasing distance between the Sun and the Earth. A mixture of these two forms the other four seasons. These are called spring, monsoon, autumn and pre-winter," sir told.

- The earth rotates on its axis.
- Because of it, day and night occurs.
- The Earth revolves around the sun is called revolution.
- Seasons are formed due to the mutual distance between the sun and the earth.



INTEXT QUESTIONS 11.2

1. When one part of the earth has a day, why is there a night in the other part?
2. How many seasons are there in our country?

3. How does the earth take to complete one round around the sun?
4. How do days and nights occur?
5. How seasons are formed?



Notes



WHAT HAVE YOU LEARNT

- The sun and along its eight planets build our solar system.
- Those that shine with their own energy are called stars.
- Those who receive light from the stars are called planets.
- The bodies that revolve around the planets are called satellites.
- The Earth revolving around the sun is called revolution.
- The earth takes 24 hours to rotate on its axis.
- Earth completes its revolution around the sun in 365 days.
- Due to the rotation of the earth on its axis, seasons are formed due to day and night and revolution.



TERMINAL QUESTIONS

1. Write the answers to the questions:
 - (i) What is a solar system called?
 - (ii) What is a Milky Way (Akash Ganga)?
 - (iii) From whom do planets and satellites take their light?
 - (iv) What is a star?



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(v) What are the various planets?

I..... II..... III..... IV.....

V..... VI..... VII..... VIII.....

(vi) What is a satellite?

2. Fill in the blanks:

(i) Earth rotates on its axis in

(ii) Earth completes its revolution in

(iii) Moon is a satellite of.....

(iv) The sun is a large ball of..... And.....

(v) All planets revolve.....

3. Mark the right () and the wrong ():

- The moon shines with its light. ()
- The Earth revolves around the Sun. ()
- The one that revolves around the Sun is called a satellite. ()
- The part of the Earth which is facing the Sun, there occurs a day. ()
- The seasons are formed by the rotation of the Earth's around the Sun. ()
- The part of the Earth that is close to the Sun is hot. ()
- There are four seasons in a year. ()

4. Try the following by yourself.
 - (1) See when days are equal to nights.
 - (2) When is the biggest night and the biggest day.
 - (3) When is the shortest night and shortest day.
 - (4) In the night, see big dipper(Sapta Rishi), Milky Way (Akash Ganga) or shooting star (Punchchal Tara), pole star (Dhruva Tara). Where does it appear? What is it's time?



ANSWERS TO INTEXT QUESTIONS

11.1

1. Earth, Mars, Mercury, Jupiter, Venus, Saturn, Uranus and Neptune.
2. The one who shines with his own light is called a star. The one who receives its light from the stars are called planets.
3. The Sun
4. The Sun

11.2

1. Sunlight does not fall on the other side of the Earth, so there It is night.
2. There are six seasons in our country.
3. 365 days.
4. Night and day are formed by the Earth's rotation on its axis.
5. By revolution of the Earth round the Sun.



Notes