

The Universe

SPECIFIC OBJECTIVES

The students learn about

- the universe and the solar system
- the moon and its special features
- eclipse, its types and formation
- tides and their formation
- artificial satellites, their types and applications

TEACHING AIDS

Pictures/animation on the solar system, the surface of moon, phases of moon, the sun, eight planets of the solar system (individually); solar and lunar eclipses (total and partial); formation of tides; artificial satellites – Aryabhata, weather satellites, scientific research, communication, military, navigation and earth observing satellites (as given in chapter)

LESSON PLAN

- The teacher will start the chapter with 'Warm Up' section by giving a brief idea of universe and will ask some questions on heavenly bodies based on previous knowledge of students. Teacher will help them to fill in the blank.
- Now, teacher will define universe that it is a wide-open space which holds all the heavenly bodies including our solar system.
- Now, teacher will discuss solar system, its members and their features.
 - **The moon:** With the help of teaching aids, teacher will explain the features of moon's surface, why it shines and why life is not possible on it and will discuss the phases of moon (as given in chapter).
 - **The sun:** With the help of teaching aids, teacher will discuss the features of the sun and explain that it is a star, much bigger than the earth and lies at the centre of solar system.
 - **Planets:** With the help of teaching aids, teacher will explain that eight planets revolve around the sun in their respective orbits and will tell special features of each planet (as given in chapter).
- Now, to check the understanding of topic, the teacher will ask students to solve 'Checkpoint 1'.
- With the help of teaching aids, teacher will define an eclipse that it is shadow formation

of one heavenly body on the other, i.e., the moon or the earth, when the light of the sun is blocked by the other.

- With the help of teaching aids, teacher will explain the types of eclipses, i.e., solar and lunar eclipses and their formation (as given in the chapter).
- Now, teacher will define tides and explain why and how they occur.
- Now, teacher will define the satellite in brief and discuss about artificial satellites, their types and their various applications.
Teacher will also show the pictures of artificial satellites including first artificial satellite launched by India (as given in chapter).
- Now, teacher will ask students to solve 'Checkpoint 2'.
- At last, teacher will sum up the chapter by going through the points given under the head 'At One Go' and make students revise the new terms given under the head 'Remember These Terms'.
- Teacher will also help students to solve the questions given under the head 'Check Your Study'.

BOOST UP

- Teacher should demonstrate the activity given in the chapter, while teaching eclipses.
- Teacher should explain the terms 'astronomy' and 'astronomer' and encourage students to explore the names of some great astronomers and their contribution to the astronomy.
- Teacher should discuss about great Indian astronomers, mathematicians and their contribution.
- Students should be encouraged to explore the names of satellites other than those given in the chapter.
- Teacher should update students with the latest discoveries in the field of space programmes.

EXPECTED LEARNING OUTCOMES

The students know about

- the universe and the solar system.
- the special features of the moon.
- the formation of eclipses and their types.
- the formation of tides and their types.
- various types of artificial satellites and their applications.

EVALUATIVE QUESTIONS

The teacher may ask the following questions for evaluating the understanding of students.

1. What do you mean by universe?
2. What is solar system?
3. What are the craters of the moon?
4. Why does the moon shine?

5. What is a new moon and a full moon?
6. Name the nearest star to the earth.
7. What is the elliptical path of the planets around the sun called?
8. Which planet is also called morning and evening star and why?
9. Why is Mars also called the 'Red Planet'?
10. Name the largest planet of the solar system.
11. When does total solar eclipse occur?
12. Which natural force causes the occurrence of tides?
13. Where do artificial satellites orbit?