NCERT Class 8 Science Chapter 17 Stars and the Solar System

Choose the correct answer in Questions 1-3.

1. Which of the following is NOT a member of the solar system?

(a) An asteroid

(b) A satellite

(c) A constellation

(d) A comet

Soln:

Answer is (c) A constellation

Explanation:

A constellation is not a member of the solar system. These are the group of stars that forms a recognizable shape is known as Constellation.

2. Which of the following is NOT a planet of the sun?

(a) Sirius

(b) Mercury

(c) Saturn

(d) Earth

Soln:

Answer is (a) Sirius

Explanation:

Sirius is a star, not the planet of the solar system.

3. Phases of the moon occur because

(a) we can see only that part of the moon which reflects light towards us.

(b) our distance from the moon keeps changing.

(c) the shadow of the Earth covers only a part of the moon's surface.

(d) the thickness of the moon's atmosphere is not constant.

Soln:

Answer is (a) we can see only that part of the moon which reflects light towards us.

Explanation:

Moon does not have its own light. It is only be seen by us when sunlight falls on the moon and gets reflected towards us. So, we can only see the part of the moon on which the sunlight falls and reflects towards us.

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4. Fill in the blanks.

(a) The planet which is farthest from the Sun is _____ .

(b) The planet which appears reddish in colour is _____ .

(c) A group of stars that appear to form a pattern in the sky is known as a _____ .

(d) A celestial body that revolves around a planet is known as _____.

(e) Shooting stars are actually not _____.

(f) Asteroids are found between the orbits of _____ and _____ .

Soln:

(a) The planet which is farthest from the Sun is **Neptune**.

(b) The planet which appears reddish in colour is **Mars**.

(c) A group of stars that appear to form a pattern in the sky is known as a **Constellation**.

(d) A celestial body that revolves around a planet is known as **satellite.**

(e) Shooting stars are actually not **stars**.

(f) Asteroids are found between the orbits of **Mars** and **Jupiter** .

5. Mark the following statements as true (T) or false (F).

(a) Pole star is a member of the solar system. ( )

(b) Mercury is the smallest planet of the solar system. ( )

(c) Uranus is the farthest planet in the solar system. ( )

(d) INSAT is an artificial satellite. ( )

(e) There are nine planets in the solar system. ( )

(f) Constellation Orion can be seen only with a telescope. ( )

Soln:

(a) False

Concept Insight: Pole Star is not a member of the Solar System.

(b) True

(c) False

Concept Insight: Neptune is the farthest planet in the solar system.

(d) True

(e) False

Concept Insight: There are eight planets in the Solar System. They are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

(f) False

Concept Insight: Constellation Orion can be seen during winters around late evenings. It is one of the most magnificent constellations in the sky, visible to the naked eyes.

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6. Match items in column A with one or more items in column B.

A	B
(i) Inner planets	**(a) Saturn**
(ii) Outer planets	**(b) Pole star**
(iii) Constellation	**(c) Great Bear**
(iv) Satellite of the Earth	**(d) Moon**
	(e) Earth
	(f) Orion
	(g) Mars

Soln:

A	B
(i) Inner planets	(g) Mars, (e) Earth
(ii) Outer planets	(a) Saturn
(iii) Constellation	(c) Great Bear, Orion
(iv) Satellite of the Earth	(d) Moon

7. In which part of the sky can you find Venus if it is visible as an evening star?

Soln:

The planet Venus is found in the western part of the sky after sunset and is said to be known as an evening star.

8. Name the largest planet of the solar system.

Soln:

Jupiter is the largest planet of the solar system.

9. What is a constellation? Name any two constellations.

Soln:

The group of stars that forms a recognizable pattern in the sky is known as a constellation.

Two constellations are; Ursa Major and Orion

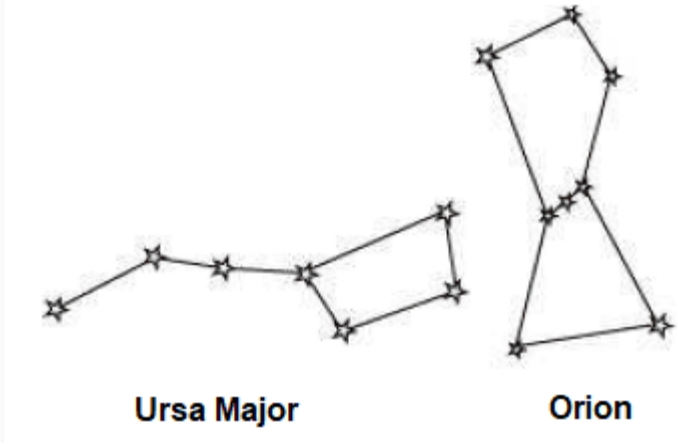
10. Draw sketches to show the relative positions of prominent stars in (a) Ursa Major and (b) Orion

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Soln:

a) Orion seems to be like a hunter. The three bright stars appear in the belt, while five bright stars are arranged in the form of a quadrilateral.

b) Ursa Major seems to be like a big dipper. There are four stars in the bowl of the dipper and three bright stars in the handle.



11. Name two objects other than planets which are members of the solar system.

Soln:

a) Meteors

Meteors are small celestial objects that are seen as bright streaks of light in the sky. Due to the heat produced by the friction of the Earth's atmosphere, the Meteors are burnt out while entering in, this causes the bright streaks in the sky. They are not planets.

b) Asteroids

The Asteroids are the collection of a huge number of small objects; gasses and dust revolving around the sun. Between the orbits of Mars and Jupiter, they occupy the large gap. These are not planets. They are the celestial bodies and are known as Asteroids.

12. Explain how you can locate the Pole Star with the help of Ursa Major.

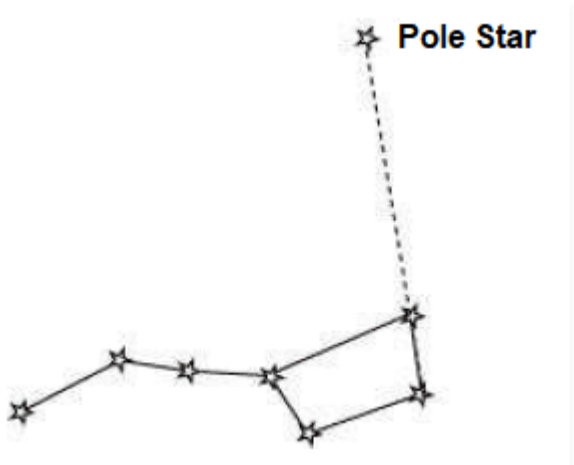
Soln:

For locating, the pole stars in the sky, first the big dropper or the Ursa Major constellation must be found . The bowl of the big dipper consists of the four bright stars.



Imagine the two stars at the end of this bowl. Then make an imaginary straight line towards the northern direction connecting these two stars.

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This imaginary line meets the star called Pole star. The length of the imaginary line from the bowl is about five times the distance between the two stars of the bowl.

13. Do all the stars in the sky move? Explain.

Soln:

No, the earth rotates on its axis from west to east. Therefore, all the stars in the sky (except the pole star) seem to move from east to west. With reference to Earth, pole star in the sky does not seem to move because it is located above the axis of rotation of the Earth in the north direction. It seems to remain stationary at a point in the sky.

14. Why is the distance between stars expressed in light years? What do you understand by the statement that a star is eight light-years away from the Earth?

Soln:

The distance of the star from the earth and the distance between the stars are very huge. It is troublesome to express this distance in kilometre (km). Therefore, these huge distances are expressed in light-years. One light-year is equal to the distance travelled by the light in one single year. One light-year is equal to 9.46×10^{12} km.

A distance of the star from the Earth is eight light-years. This means the distance between them is equal to the distance travelled by the light in eight years, i.e. distance of the star is $8 \times (9.6 \times 10^{12}) = 7.6 \times 10^{13}$ km away from Earth.

15. The radius of Jupiter is 11 times the radius of the Earth. Calculate the ratio of the volumes of Jupiter and the Earth. How many Earths can Jupiter accommodate?

Soln:

Let us consider Jupiter and Earth are two spheres with radii R and R' respectively. Given in the question that radius of Jupiter is 11 times the radius of the Earth.

So, $R' = 11R$

Volume of sphere of radius r is given as = $\frac{4}{3}\pi r^3$

Volume of Earth = $\frac{4}{3}\pi r^3$

And, volume of Jupiter = $\pi(R^1)^3$

$= \frac{4}{3}\pi(R^1)^3 = 1331[4/3\pi R3]$

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The ratio of the volume of Jupiter and earth

=volume of Jupiter volume of Earth =1331(4/3πR3)4/3πR3=1331

Therefore, this ratio suggests that Jupiter can fit 1331 number of Earth in it.

16. Boojho made the following sketch (Fig. 17.29) of the solar system. Is the sketch correct? If not, correct it.

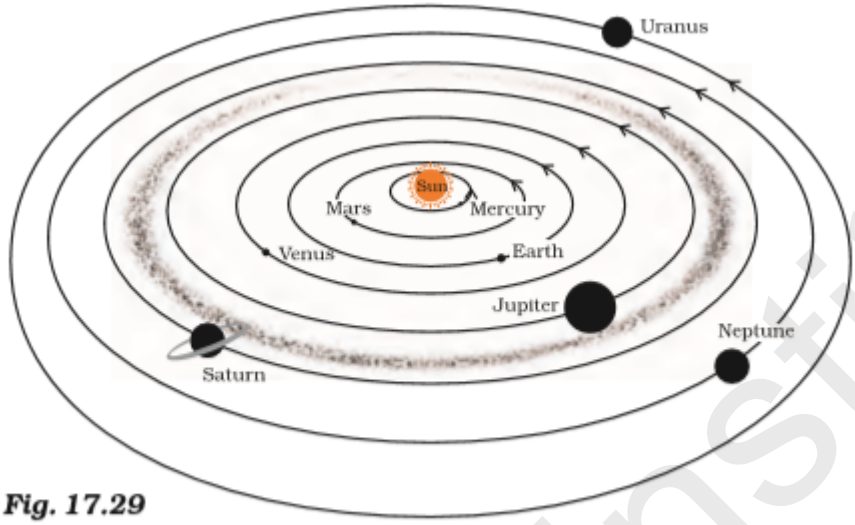


Fig. 17.29

Soln:

No, the diagram made by the Boojho is not correct, because in the solar system the sequence of the planets of their distance from the sun is like; Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Here he had changed the positions of the planets Venus, Mars, Neptune and Uranus. Besides this, he had shown in the diagram that shows the Asteroids belt in the gap between the orbits of Saturn and Jupiter. This is incorrect. The Asteroids belt is located in the middle of the orbits of Jupiter and Mars. The correct diagram of the solar system is given below:

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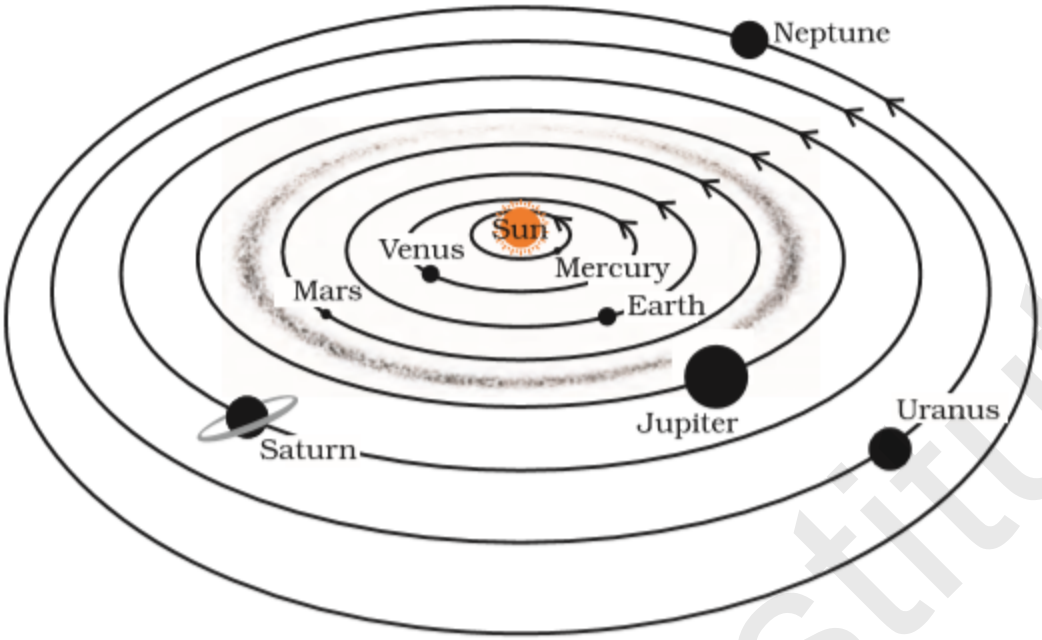


Fig. 17.17 : *The solar system (not to scale)*

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