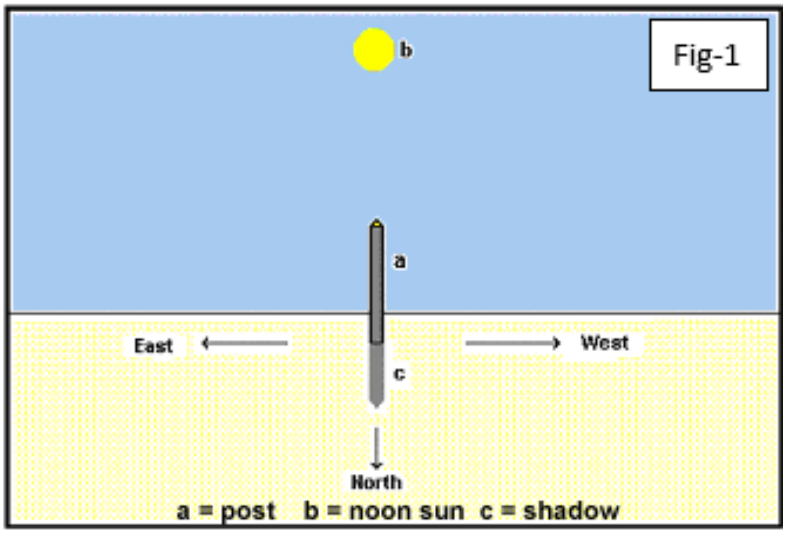
Stars And Solar System

Improve your learning

Q. 1. What is your local noon time?

Answer : Local noon time is a time when the **sun** is highest in the sky. You can observe it by observing a shadow of a pole when it will be just below it or it will be shortest in length. Local noon time of Hyderabad is 12:13 p.m. You find local noon time in your city.



Q. 2. Where do you find moon at night.

a) 2days before Purnima
b) 2days after Amavasya

Answer :

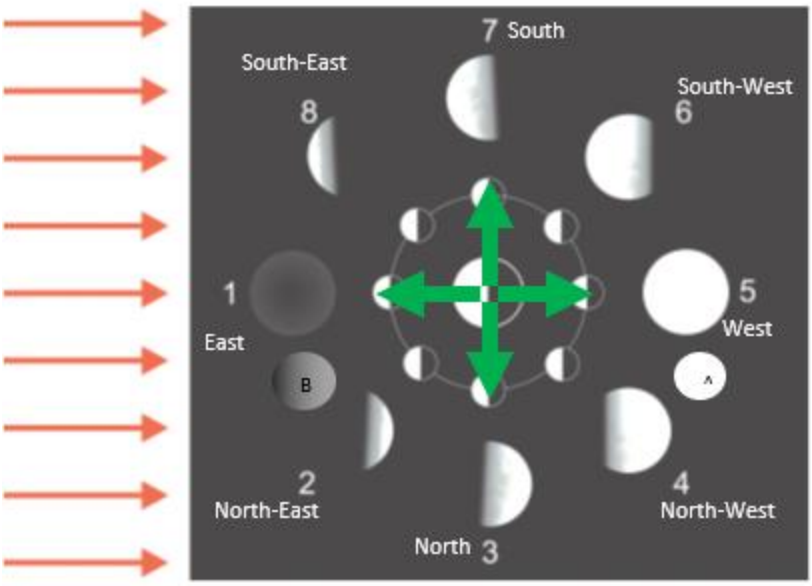


Fig-2

(a): As you can see in the fig-2 as point A, You can locate it in North-West direction.

(b): As you can see in the fig-2 as point B, You can locate it in North-East direction.

Q. 3. Why doesn't eclipse occur on every full moon day or on every new moon day?

Answer : A lunar eclipse occurs when Moon enters the Earth's shadow. It occurs on a full moon. A solar eclipse occurs when the Moon comes in between the Sun and the Earth. It occurs on the new moon. They do not happen every on every full moon day or on every new moon day because the earth's orbit around the sun is not in the same plane as the Moon's orbit around the Earth.

Moon's orbit is 5º tilted than earth's orbit around the sun. That's why they don't come in each other's orbit very often.

Fig-3

Q. 4. Where do you find the pole star?

Answer : You can find the pole star in the northern sky. When you will look in the sky in the north direction, you will see the pole star. It is one of the brightest stars in the sky, so it is easy to locate it. For exact location, locate the great Bear, look at the two stars that form the outer side of its rectangular head. Extend an imaginary line from these two stars (as shown in figure 4). The pole star will be located on that extended line with a distance of about 5 times the distance between these two stars. You can see it in North Direction.

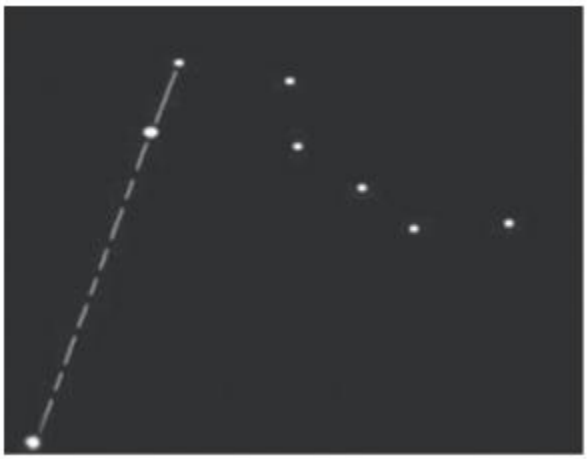


Fig-4

Q. 5. What is the difference that you find between Polestar and other stars?

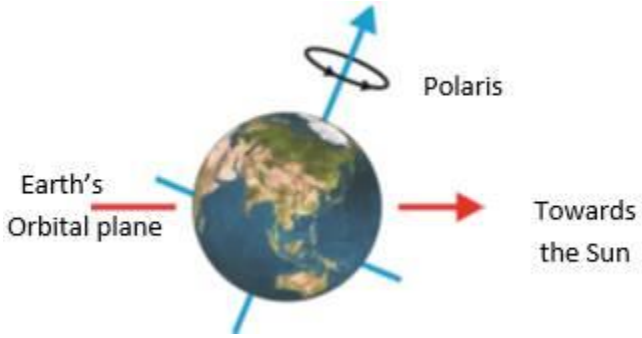
Answer :

Pole star	Other stars
1. It is aligned with the axis of rotation of the earth.	1. These are not aligned with the axis of rotation of the earth.
2. It seems that it remains fixed at its position.	2. They seem to change their position.
3. It is used to find direction in the night.	3. They are not used to find directions in the night.
4. It can't be seen from southern hemisphere due to its fixed position.	4. They are being seen from southern hemisphere as they change their position.

Q. 6. Why does polestar seem to be stationary?

Answer : When we see a fan rotating around its axis, by standing just below it, we can observe that center point of a fan, about which it is rotating, is not changing its position.

Similarly, the pole star is situated in the direction of the earth's axis and that is why it does not appear to move even though all stars appear that they are moving because of the rotation of the earth.



Q. 7. Name some constellations.

Answer : Name of some constellations are as follows:

(i) The Great Bear (saptrishi)

(ii) Orion

(iii) Leo (Simha Rashi)

(iv) Cassiopeia (Sharmistha)

Q. 8. How many planets are there in our solar system? What are they?

Answer : There are eight planets in our solar system. They are

Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Q. 9. Look at the table-2 and name the smallest and the biggest planets in our solar system.

Table-2 : Comparison between planets

Name of the Planet	Comparative Diameter with Diameter of Earth	Distance from the Sun in Crore km.	Period of revolution	No. of satelites (detected so far)
Mercury	0.38	5.79	88 days	0
Venus	0.95	10.8	225 days	0
Earth	1	15	365 days	1
Mars	0.53	22.8	687 days	2
Jupiter	11.19	77.8	12 years	50
Saturn	9.40	142.7	29.5 years	53
Uranus	4.04	286.9	84 years	27
Neptune	3.88	449.7	165 years	13

Answer : By looking up the Table-2, we can conclude that Mercury is the smallest and Jupiter is the largest planet in our solar system.

Q. 10. Among all 8 planets, what is the special thing about earth?

Answer : There are following special things about earth:

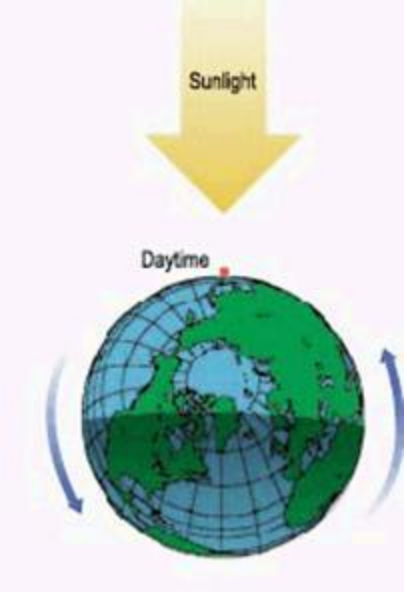
(i) The most special thing about earth is it is the only planet in our solar system where life exists.

(ii) Some special environmental conditions are responsible for the existence and continuation of life on the earth.

(iii) It is just the right distance from the sun so that it has the right temperature range, the presence of water and suitable atmosphere and a blanket of ozone.

Q. 11. How do day and night occur?

Answer : Occurrence of the day: When we see the sun shining in the sky, we call it day. It happens due to rotation of the earth. Earth revolves around the sun and also rotates at its own axis. During rotation of the earth, it's half of the part become exposed to sunlight. In this part, day occurs. We can see the sun shining in the sky in that part.



The occurrence of the night: When we don't see the sun shining in the sky and sky becomes dark, we call it night. It also happens due to rotation of the earth. During rotation of the earth, in it's another half, sunlight doesn't reach due to the spherical shape of the earth. In this part, Night occurs.

Q. 12. Do the stars appear moving? How can you say?

Answer : Yes the stars appear moving. We can say this due to following reasons:

(i) Stars don't move from their position in space. They remain fixed at their position.

(ii) They appear moving when we see them from earth.

(iii) We know that the earth rotates about its axis and revolves around the sun. Therefore, the earth is changing its position constantly.

(iv) As we are living on earth, so it seems stationary to us while the stars appear moving. For example- When we are sitting in a train, trees outside the train appear moving.

(v) Due to rotation of earth from east to west. Sun is also a star and we daily see that it rises in the east and sets in the west. It happens due to rotation of the earth about its axis.

Q. 13. Is it possible to see the polestar for the people who live in the southern hemisphere of the earth? Why?

Answer : No. People who live in southern hemisphere of the earth will not be able to see polestar because polestar is situated directly over the north pole of the earth and stays there all the time. Unlike other stars, it doesn't move. Therefore people living in southern hemisphere can't see polestar.

Q. 14. What is the use of artificial satellites in our daily life?

Answer : Artificial satellites are very useful in our daily life. We can't imagine our today's life without them. All the internet facilities, messaging facilities are provided with the help of these satellites. They are used for forecasting weather, transmitting television and radio signals. They are also used for telecommunication, remote sensing (collecting information from a distance) in aviation and military use.

Q. 15. Why is Venus the brightest planet?

Answer : Venus is the brightest planet because it has a covering of thick clouds over it. Its thick clouds reflect most of the sunlight that reaches it (about 70%) back into space, and because it is the closest planet to Earth. Therefore, it appears brightest.

Q. 16. Are you curious about going to the moon? Why?

Answer : Yes, I am curious about going to the moon because, since childhood, we heard a lot of myths about the moon. I want to go there and find out the reality about it. I want to visit its atmosphere and look earth from there. I have heard that people can jump long distances over there in one step due to low gravity. I want to experience these things.

Note: You are requested to write your own reason.

Q. 17. While observing the shadow of a stick from morning to evening, some questions arose in Ramya's mind. What may be those questions?

Answer : While observing the shadow of a stick from morning to evening, some questions that may arise to Ramya's mind are:

(i) Why does shadow change its length?

(ii) Why does shadow stick first decreases till noon then again start increasing after noon?

(iii) How does Sun change its position?

Note: You are requested to write your own thoughts.

Q. 18. What are the questions that engage your mind when you look at the night sky?

Answer : The questions that engage my mind when I look at night sky are:

(i) Is there exists any life on other stars?

(ii) How long will it take to reach those stars?

(iii) Why do these stars twinkle at night?

(iv) Why do these stars don't appear in the day light?

(v) How these stars and moon were formed?

Note: You are requested to write your own questions that engage your mind.

Q. 19. Even though we do not have a clock, we can know the time by observing some shadows in day time. Think and discuss with your friends how we can know the time at night.

Answer : We can know the time at night by observing the positions of The Great Bear constellation and the pole star. We can think pole star as the center of the clock and The Great Bear constellation as the hand of the clock. Every hour constellation moves by 15^{o} per hour. In this way, we can know the time at night.

Q. 20. How can you find north-south direction at your place?

Answer : We can know the north and south direction by observing the direction in which the sun rises. When we move our face in that direction then our direction in the left-hand side will be north and direction on the right hand side will be south.

We can also know the north and south direction by observing the direction in which the sun sets. When we move our face in that direction then our direction in the left-hand side will be south and direction on the right-hand side will be north.

Q. 21. In which direction (towards north or south) is the sun moving day by day when you read this lesson?

Answer : When I read this lesson, it is the month of December. So these days sun is moving towards the south. Actually, Sun moves towards south day by day from July to December and moves towards north day by day from January to June.

Q. 22. What are the planets you have seen in the sky? When do you observe those planets?

Answer : I have seen Venus, Jupiter, and Saturn in the sky. I have observed Venus in the morning sky and in the evening sky also.

I have observed Jupiter and Saturn during dawn sky just before the sun rises.

Note: You are requested to write your own observation.

Q. 23. What is the duration of a day and night today? Collect the information about the duration of day night for the past 7 days from the newspapers, analyze it and say whether summer or winter is going to come.

Answer : This is the month of December. Duration of the day is 11 hours 15 minutes and night length is 12 hours 45 minutes.

2017	Sunrise/Sunset		Daylength	
Dec	Sunrise	Sunset	Length	Difference
1	06:22 (112°)	17:37 (247°)	11:15:29	−0:24
2	06:22 (113°)	17:37 (247°)	11:15:06	−0:23
3	06:23 (113°)	17:38 (247°)	11:14:44	−0:22
4	06:23 (113°)	17:38 (247°)	11:14:23	−0:20
5	06:24 (113°)	17:38 (247°)	11:14:03	−0:19
6	06:25 (113°)	17:38 (247°)	11:13:44	−0:18
7	06:25 (113°)	17:39 (247°)	11:13:26	−0:17

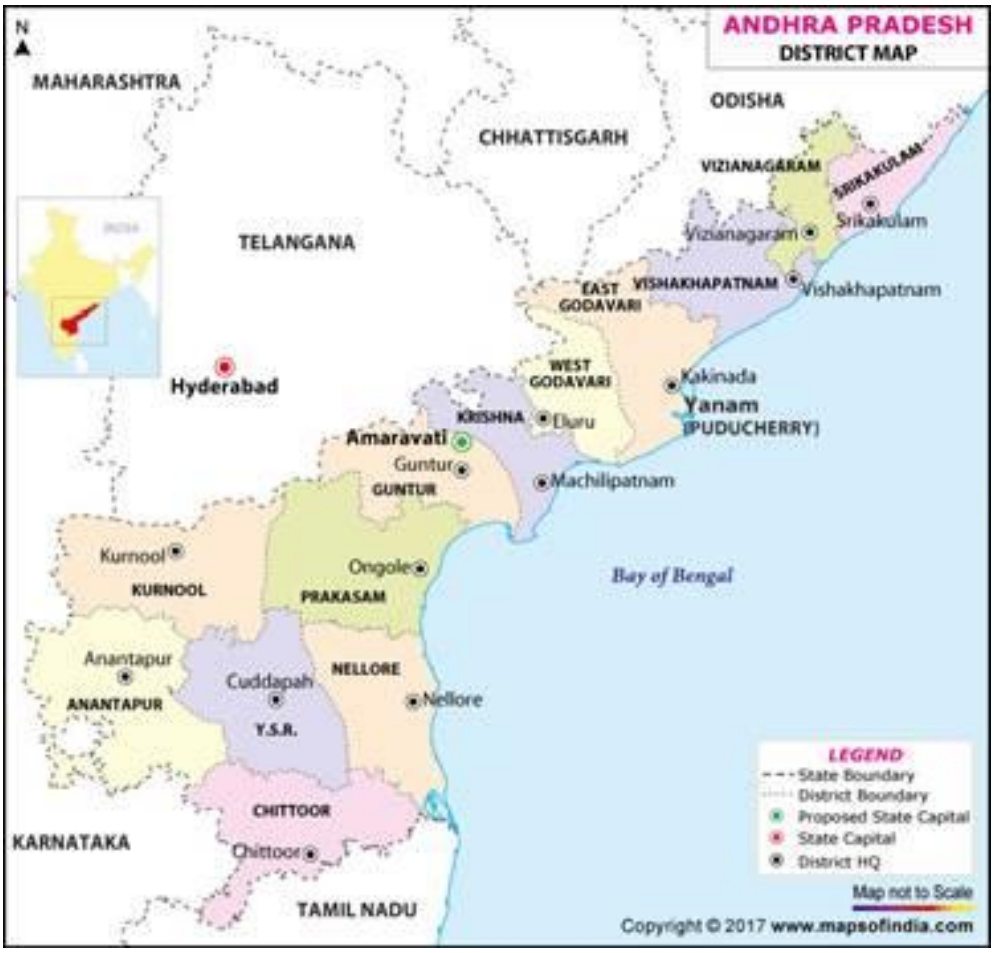
Fig- Day length of Andhra Pradesh during December 2017.

You can calculate night length by subtracting day length from 24.

Q. 24. What are the other districts on the same latitude as your district?

Answer : I reside in Anantapur. Districts which are on the same latitude is Nellore.

You can find yours by seeing the map.



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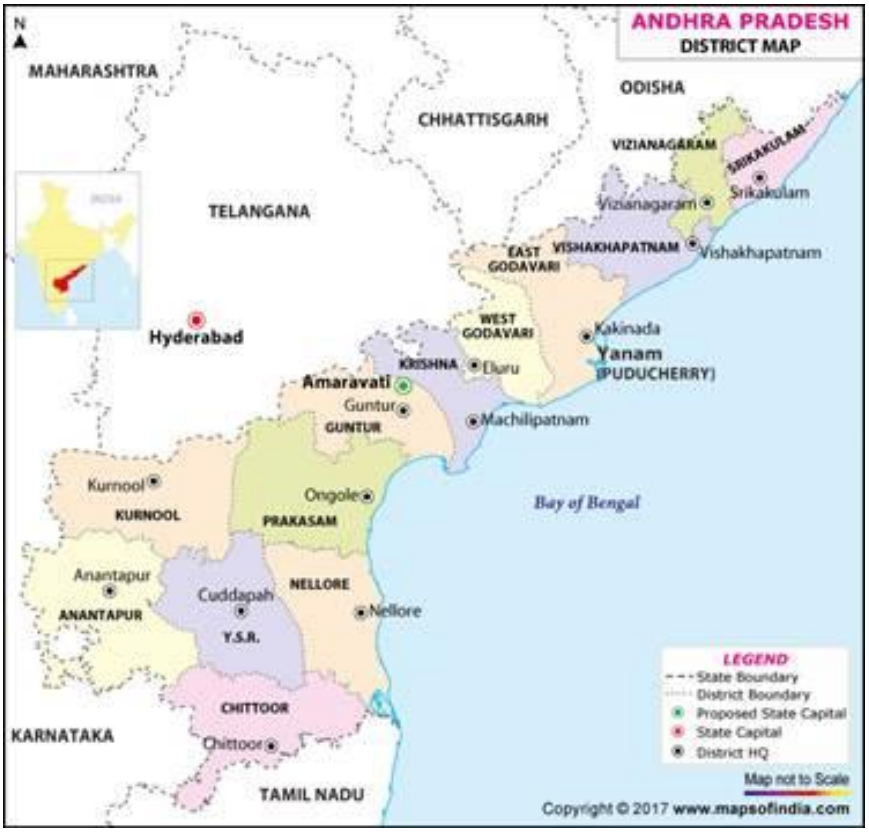


Q. 25. Collect information about cosmic dust (wastage) from newspapers, internet and make a poster on your school panel board about the consequences of cosmic dust.

Answer : Cosmic dust is dust which exists in outer space as well as all over our planet Earth. It has great consequences like:

(i) It can affect the growth of the crops.

(ii) It has radioactive properties which can harm our skins.

(iii) It can go into our body by inhalation and cause breathing problems.

You can design your own posters.

Fig- Sample Poster

Q. 26. Make a sundial. Explain how you made it.

Answer : Steps for making Sundial are

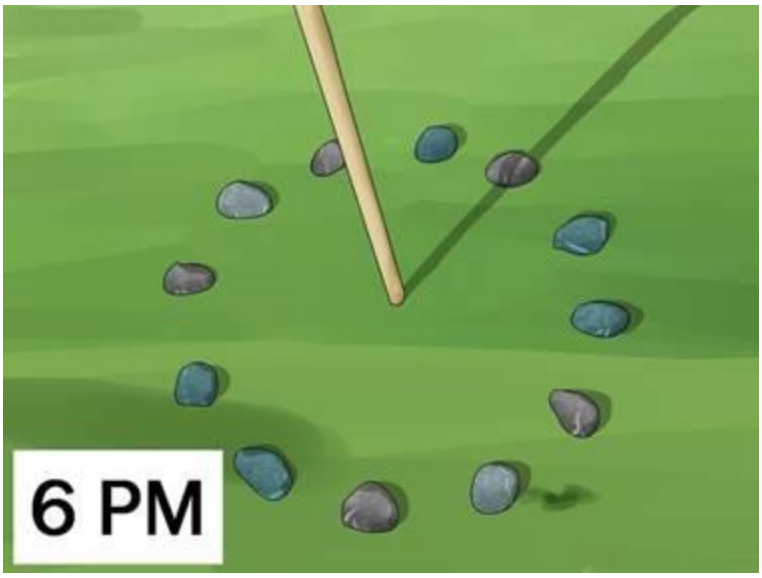
(i) Collect tools like a stick (2 feet long), pebbles and a wrist watch.

(ii) Find a suitable and sunny area to plant the stick and plat it there. If you are living in northern hemisphere then slightly slant the stick towards the north. If you are in southern hemisphere then slant the stick towards the south.

(iii) If you want to complete the sundial in a single day, begin in the morning after the sun has fully risen. Survey the stick at 7:00 a.m. As the sun shines down on it, the stick will cast a shadow. Use one of your pebbles to mark the place where the shadow falls on the ground.

(iv) Return at 8:00 a.m. and use another pebble to mark where the stick's shadow falls on the ground. Do the same thing at 9:00 a.m., 10:00 a.m. and so on.

(v) Get back every hour and mark it with a pebble on the ground. Do this until there is no more sunlight left in the day. Your sundial will be complete at day's end. As long as the sun is shining, you can use this simple device to tell what time of the day it is.



Q. 27. Draw the different phases of moon. Arrange them in a order from Purnima to Amavasya.

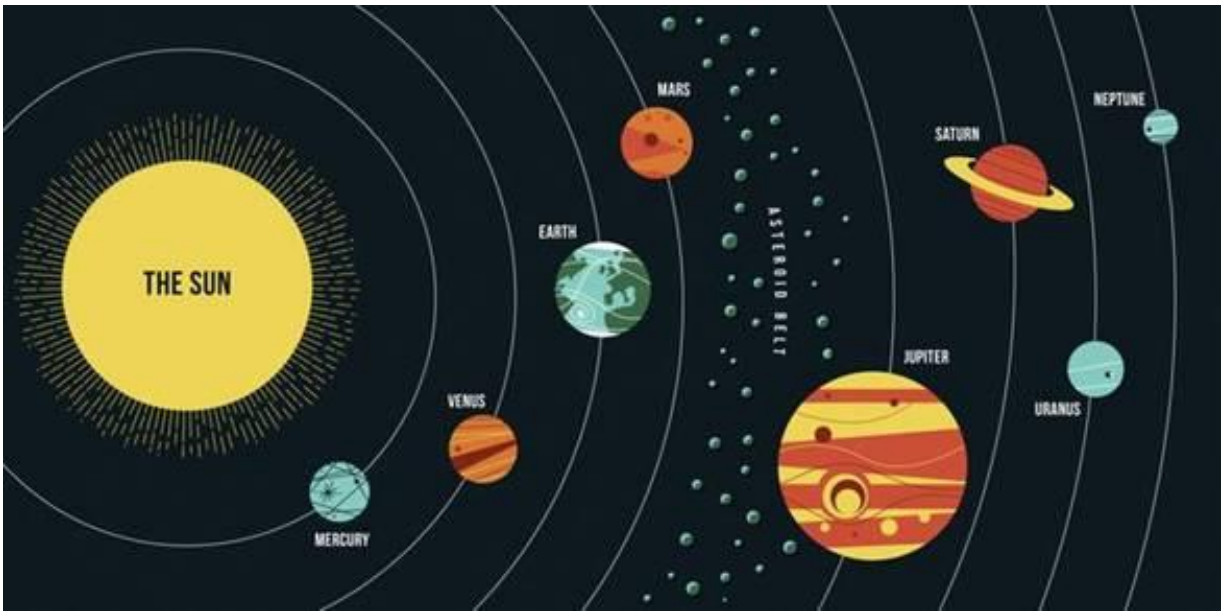
Answer :

Q. 28. Draw the location of polestar showing the direction from Great Bear.

Answer : If you are able to spot the great bear, look at the two stars that form the outer side of its rectangular head. Extend an imaginary line from these two stars (as shown in the figure). The pole star will be located on that extended line with a distance of about 5 times the distance between these two stars.

Q. 29. Draw the diagram of the solar system.

Answer :



Q. 30. How do you appreciate the construction of knowledge about the Universe by our ancestors?

Answer : We really appreciate the construction of knowledge about the Universe by our ancestors. Their valuable contributions are:

(i) They researched very hard and defined laws of physics which help us to understand the movement of celestial bodies.

(ii) They invented different devices and instruments like telescope through which we can observe the distant celestial bodies.

(iii) They derived different mathematical formulas to predict the happenings in-universe.

(iv) They built satellites and sent them to different planets for observing the existence of life and other resources.

Q. 31. We launched many artificial satellites around our earth for different purposes. What do you think about the impact of artificial satellites and their radiation on bio diversity?

Answer : We all know that artificial satellites have made our life more comfortable. But there are some negative aspects also. Impact of artificial satellites and their radiation on bio diversity are as follows:

(i) During the launching of artificial satellites, emits a lot of smoke and dust which pollutes our environment.

(ii) Artificial satellites also emit radiation which causes harmful effect on a living thing.

(iii) More exposed to radiation from artificial satellites causes heart problems.

(iv) Due to the absence of repair shop in space. Space is becoming heavily crowded of these satellites.

Q. 32. Among eight planets of our solar system, the earth is the only planet supporting life. Explain how we should protect our earth and its environment.

Answer : We can take following majors to protect our earth and its environment:

(i) We should plant trees as much as possible because trees help us to reduce global warming and maintain nature's balance.

(ii) We should conserve water. Water is very essential for existence of life on earth and it is degrading day by day.

(iii) We should dispose toxic wastes into proper way because it harms the living bodies where it is disposed resulting in unbalance in nature.

(iv) We should use more bio-degradable substances which can be decomposed easily. Use of plastics should be avoided.

(v) Reuse and recycle the things that we use.

(vi) Use of vehicles which emits smoke should be avoided because it causes air pollution.

(vii) Use natural resources like coal, petrol etc. judiciously.