पुना International School

Shree Swaminarayan Gurukul, Zundal

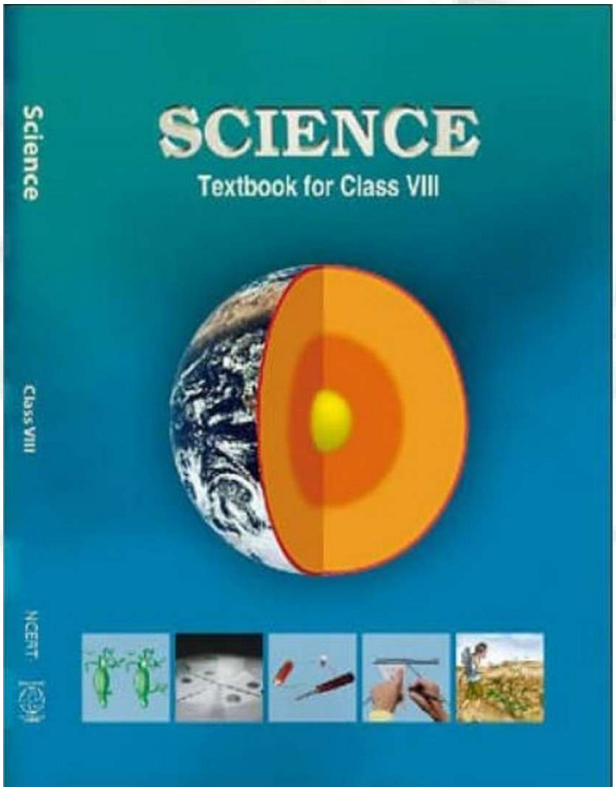
Class -VIII

SUBJECT - SCIENCE

[Sample Plan]

TERM - 2

DECEMBER



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Chapter – 16
Light

❖ **Define the terms -**

1) Light: The natural agent that stimulates sight and makes things visible. Light is reflected from all surfaces. It is a form of energy.

2) Reflection of Light: Bouncing back of light after striking a shiny or polished surface, in the same medium, is called reflection.

3) Types of Reflection:

(i) Regular Reflection: When a beam of parallel light rays is incident on a smooth and plane surface, the reflected rays will also be parallel. This type of reflection is called Regular Reflection. The reflection from a plane mirror is an example of regular reflection.

(ii) Diffused or Irregular Reflection: When light is incident upon a rough or uneven surface, it is reflected in many directions due to presence of irregularities on that surface.

4) Parts of Human Eye:

(i) Cornea: Transparent bulge on the front surface of the eyeball which protects the eye and helps in refraction of light.

(ii) Iris: Coloured diaphragm behind the cornea which controls the amount of light entering the eye.

(iii) Pupil: Dark hole in the middle of iris through which light enters the eye.

(iv) Eye lens: Transparent, crystalline structure behind pupil and iris.

(v) Ciliary muscles: Hole the eye lens in position and control the focal length of the eye lens.

(vi) Retina: Surface of the rear part of the eyeball where the light entering the eye is focused.

(vii) Rods and Cones: Rod cells respond to the brightness of light while cone cells respond to colours.

(viii) Blind spot: It is the least sensitive point where no rods and cones are present.

(ix) The space between the cornea and the eye lens is filled with **aqueous humour.**

(x) The space between the eye lens and the retina is filled with **vitreous humour.**

❖ **Extra Questions:-**

Very short Answer Questions :-

1. How many times is a ray of light reflected by two plane mirrors placed parallel and facing each other ?

Ans: Infinite number of times.

2. The angle between incident ray and reflected ray is 60°. What is the value of angle of incidence ?

Ans: According to the law of reflection, angle of incidence is always equal to the angle of reflection.

Let , incident ray = reflected ray = x.

The angle between incident ray and reflected ray is 60°

$2x = 60°$

$x = 60° \div 2 = 30°$

angle of incident ray = 30

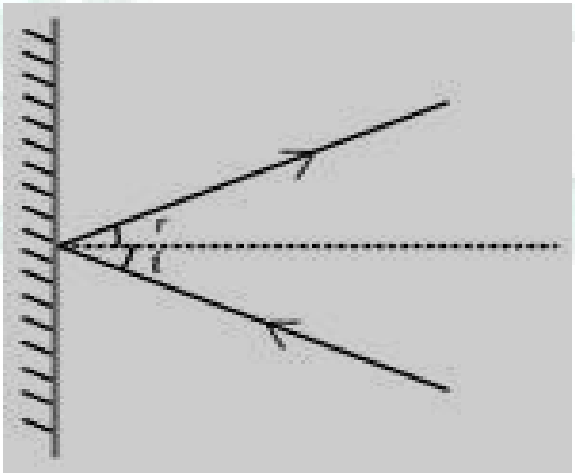
Short Answer Questions :-

1. What happens to light when it gets dispersed ? Give an example.

Ans: Light is split into its constituent colours. Rainbow is a natural phenomenon showing dispersion of light.

2. Draw figure showing the position of the plane mirror. Also, label the angle of incidence and angle of reflection on it.

Ans:

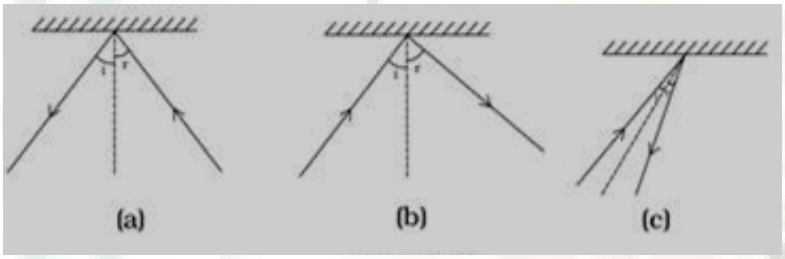


3. Look at Fig. given below . Can the image of the child in it be obtained on a screen ?

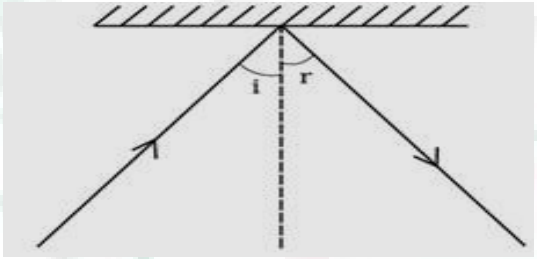
Ans: No, the image of the child cannot be obtained on a screen.

Long Answer Questions :-

1. There is a mistake in each of the following ray diagrams given as Fig. a, b and c. Make the necessary correction (s).



Ans: According to the laws of reflection; angle of incidence is always equal to the angle of reflection. And the normal line is at 90° to the plane. In all of these cases the figures should be as follows:



2. Explain the process which enables us to perceive motion in a cartoon film.

Ans: The cartoon film we see is actually the projection of static pictures on the screen in a specific order. Usually the static pictures are shown in a sequence at the rate of 24 pictures per second one after the other giving us the perception of movement.

3. How is the phenomenon of reflection used in making a kaleidoscope ? What are the applications of a kaleidoscope ?

Ans: In a kaleidoscope, three plane mirrors inclined at an angle of 60° to each other are joined together, and fixed in a tube. This operates on the principle of multiple reflections and used to find colourful patterns.

Applications of a kaleidoscope are as follows :-

Designers and artists use kaleidoscope to get ideas for new patterns to design wallpapers, Jewellery and fabrics.

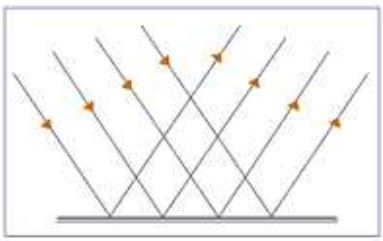
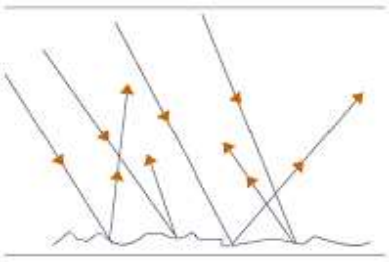
EXERCISE:-

1. Suppose you are in a dark room. Can you see objects in the room? Can you see objects outside the room? Explain.

Ans. We can see an object from which reflected rays enter our eyes. The light may be emitted by the object or may have been reflected by the object. Thus we cannot see an objectwhich is placed in a dark room if it does not emit light of its own. Whereas an object outside the dark room can be seen if there is either light outside the dark room or the object emit its own light.

2. Differentiate between regular and diffused reflection. Does diffused reflection means the failure of the laws of reflection?

Ans.

Regular Reflection	Diffused Reflection
i. It occurs when parallel beam of incident rays remain parallel after reflection.	i. It occurs when parallel beam of incident rays doesn't remain parallel after reflection.
ii. Occurs from smooth surfaces like mirror, silver spoon etc.	ii. Occurs from rough surfaces like wood, table, door, book etc,
iii. 	iii. 

No, diffused reflection is not the failure of the laws of reflection.

3. Mention against each of the following whether regular or diffused reflection will take place when a beam of light strikes. Justify your answer in each case.

(a) Polished wooden table

(b) Chalk powder

(c) Cardboard surface

(d) Marble floor with water spread over it.

(e) Mirror

(f) Piece of paper.

Ans. (a) Regular reflection will take place because polished wooden table will have a smooth surface.

(b) Diffused reflection will take place because it is rough (not smooth) surface.

(c) Diffused reflection will take place because it is rough surface.

(d) Regular reflection as it will act like a plane mirror.

(e) Regular reflection will take place because plane mirror is a polished surface.

(f) Diffused reflection because suface of paper is rough.

4. State the laws of reflection.

Ans. The laws of reflection are -

(a) The angle of incident is always equal to angle of reflection.

(b) The incidence ray, the reflected ray and the normal are lie in the same plane.

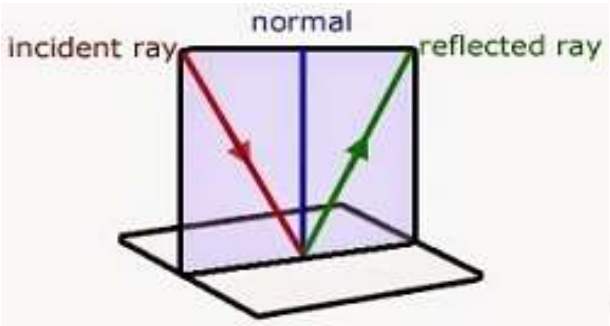
5. Describe an activity to show that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

Ans. Place a plane mirror on the table. Take a paper sheet and make a small hole in its centre. Make sure that the light in the room is not bright. Hold the sheet normal to the table. Take another sheet and place it on the table in contact with the vertical mirror. Draw a normal line on the second sheet from the mirror. Now, light a torch on the mirror through the small

hole such that the ray of light falls on the normal at the bottom of the mirror. When the ray from this hole is incident on the mirror, it gets reflected in a certain direction. You can easily

observe the incident ray, reflected ray and the normal to the mirror at the point of incidence on the sheet placed on the table. This shows that the incident ray, the reflected ray, and the

normal to the surface at the point of incidence all lie in the same plane.



6. Fill in the blanks in the following.

(a) A person 1 m in front of a plane mirror seems to be **2m** away from this image.

(b) If you touch your **left** ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with **left hand.**

(c) The size of the pupil becomes l**arge** when you see in dim light.

(d) Night birds have **less** cones than rods in their eyes.

7. Angle of incidence is equal to the angle of reflection.

(a) Always

(b) Sometimes

(c) Under special conditions

(d) Never

Ans. (a) always.

8. Image formed by a plane mirror is

(a) Virtual, behind the mirror and enlarged

(b) Virtual, behind the mirror and of the same size as the object

(c) Real at the surface of the mirror and enlarged

(d) Real, behind the mirror and of the same size as the object

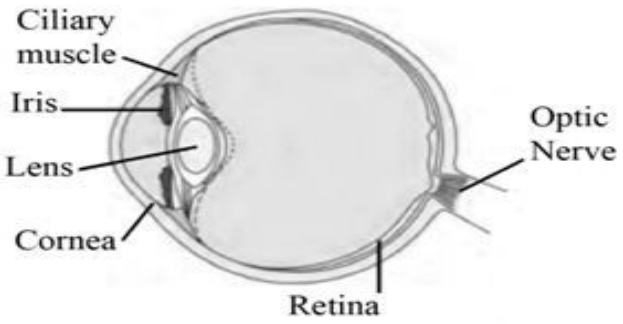
Ans. (b) Virtual, behind the mirror and of the same size as the object.

9. Describe the construction of a kaleidoscope.

Ans. Kaleidoscope is an optical instrument used to see a number of beautiful patterns. It is made up of a circular cardboard tube or tube of a thick chart paper in which rectangular mirror strips are joined together to form a prism. At one end of tube, touching these mirrors, a circular glass plate is fixed. Several small pieces of coloured glass are placed upon it. This end is closed by ground glass plate and beautiful patterns are seen through the other end of the kaleidoscope.

10. Draw a labelled sketch of the human eye.

Ans.



11. Gurmit wanted to perform activity 16.8 using a laser torch. Her teacher advised her not to do so. Can you explain the basis of the teacher's advice?

Ans. Laser rays can cause permanent damage in the eyes. Thus, Gurmit will lose her eye sight if laser torch is directed over her eyes.

12. Explain how you can take care of your eyes.

Ans. The following care should be taken to keep our eyes healthy:

(a) We should not look at the sun or a powerful light source diretly.

(b) Too dim or more bright light is bad for the eyes.

(c) If advised, suitable spectacles should be used.

(d) We should always read from a normal distance for distinct vision.

(e) We should never rub our eyes if any small particle or dust goes into the eyes.

(f) Food containing Vitamin A should be used.

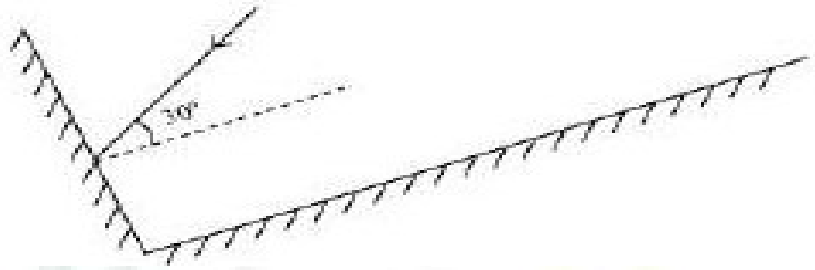
13. What is the angel of incidence of a ray if the reflected rays is at an angle of 90o to the incident ray?

Ans. The angle of incidence is 45°.

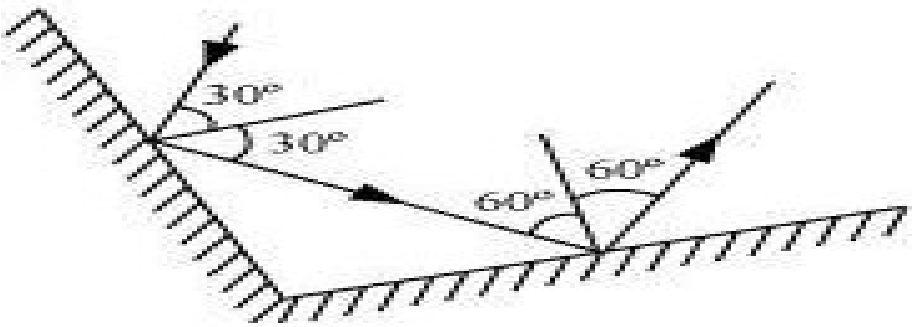
14. How many images of a candle will be formed if it is placed between two parallel plane mirrors separated by 40 cm?

Ans. Infinite number of images will be formed.

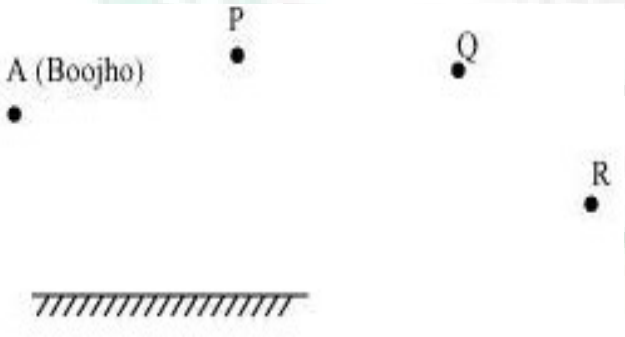
15. Two mirrors meet at right angles. A ray of light is incident on one at an angle of 30 degree as shown in fig. 16.19. Draw the reflected ray from the second mirror.



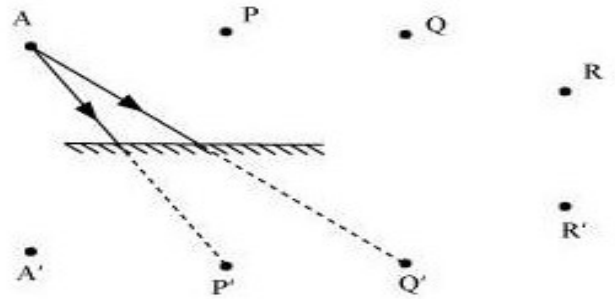
Ans.



16. Boojho stands at A just on the side of a plane mirror shown in fig. 16.20. can he see himself in the mirror? Also can he see the image of objects situated at P,Q and R?



Ans. Boojho will not be able see himself in the mirror. But he can see image of objects situated at P and Q.

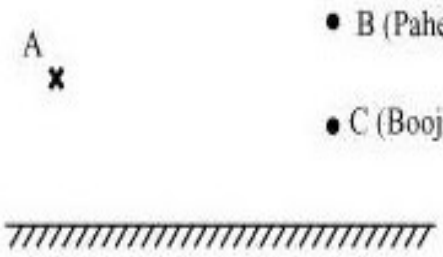


17. (a) Find out the position of the image of an object situated at A in the mirror.

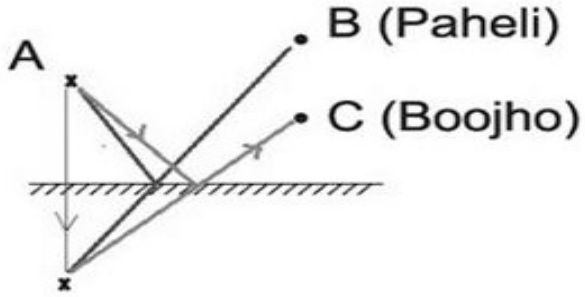
(b) Can paheli at B see this image?

(c) Can Boojho at C see this image?

(d) When Paheli moves from B to C, where does the image of A move?



Ans. (a) A image will be formed at the same distance behind the mirror.



(b) Yes.

(c) Yes.

(d) The image remains at the same place. The image moves only if the object or the mirror is moved.

Chapter – 17

Stars and the Solar System

❖ **Define the terms -**

1)Celestial Bodies: All natural bodies visible in the sky, outside the Earth's atmosphere, constitute the celestial bodies, e.g. stars, planets, their moons, comets, asteroids, meteors, etc. The **Moon** is the celestial body closest to us.

2)Solar system: The Sun and the celestial bodies that revolve around it form the solar system. It comprises large number of bodies like planets(8 known till date), their moons, comets, asteroids, meteoroids, meteors and meteorites. These objects are held together in the solar system due to Sun's gravitational pull.

3)Sun: It is the source of almost all energy on Earth. It continuously emits huge amounts of heat and light.

4) **Planets:** Planets reflect sunlight that is incident on them. They have no light of their own, so they don't twinkle like the stars. Planets have definite paths called orbits in which they revolve around the sun. The time taken by a planet to complete one full revolution around the sun is called its period of revolution. The time taken by a planet to rotate a full 360 degrees on its axis is called its period of rotation. Time taken by a planet to complete one revolution increases as the distance from the sun increases.

❖ **Extra Questions:-**

Very short Answer Questions :-

1. John saw full moon on a particular day. After how many days will he be able to see the full moon again ?

Ans: John will be able to see the next full moon in slightly longer than 29 days.

2. In the picture of rotating earth given as Fig. 17.3 mark the position of pole star.

Fig. 17.3

Ans: The pole star is situated in the direction of the earth's rotation axis.

3. Do stars emit light only during night ?

Ans: The stars are present in the sky even during the day-time. But they are not visible during daytime because of the bright sunlight.

❖ **Short Answer Questions :-**

1. A star is ten light years away from the earth. Suppose it brightens up suddenly today. After how much time shall we see this change ?

Ans: We will see the change after 10 years.

2. Meteors are not visible during the daytime. Explain the reason.

Ans: Meteors are very small, star-like objects that are revolving around the sun. They become visible only when, by some chance, they enter the earth's atmosphere. When a meteor enters the earth's atmosphere, it is travelling very fast . . . about 2 miles a second. At such high speeds, it gets heated due to friction with the molecules in the earth's atmosphere. The heat produced is so high that the meteor begins to burn. It glows and evaporate quickly. But its brightness is extremely small compared to that of the sun due to which it is not visible during day time.

3. Why does the moon change its shape daily ?

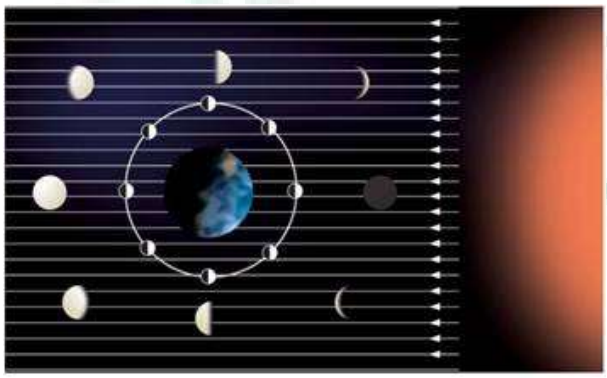
Ans: The moon changes its shape daily because we see only that part of the moon from which the light of the sun is reflected towards us.

❖ **Long Answer Questions :-**

1. Look at Fig. carefully and answer the following question :

(a) In which part of the sky would you see the full moon in the evening ?

(b) In which part of the sky would you see the crescent moon in the evening ?



Ans: (a) We see the full moon in the evening in the eastern part of the sky.

(b) We see crescent moon in the evening in the western part of the sky.

2. Write the names of all planets in the given figure.

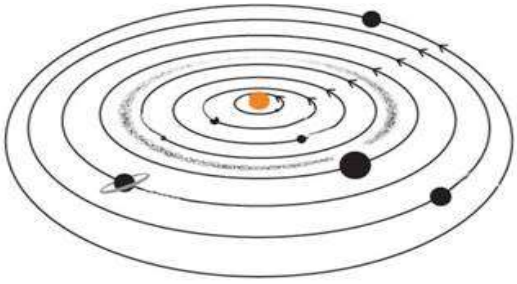
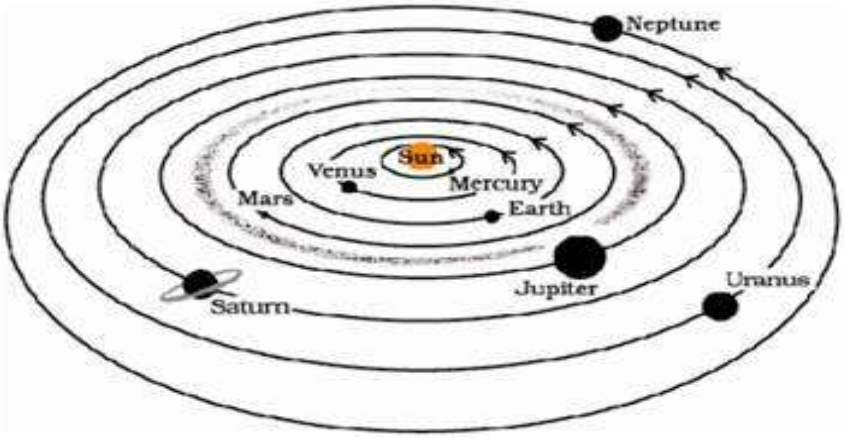


Fig. 17.8

Ans:



3. Suppose the distance between earth and sun becomes half of its present distance. What is likely to happen to life ?

Ans: The sun continuously emits huge amounts of heat and light and acts as the sources of almost all energy on the Earth. If the sun gets closer to earth the survival won't be possible due to excessive heat from sun. Life would no longer exist on earth.

EXERCISE:-

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

Ans: (c) A constellation

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

(a) Sirius

(b) Mercury

(c) Saturn

(d) Earth

Ans: (a) Sirius

3. Phases of 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.

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

4. Fill in the blanks.

(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, which appear to form a pattern in the sky is known 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 the artificial satellite. ( )

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

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

Ans: (a) (F) (b) (T) (c) (F) (d) (T) (e) (F) (f) (F)

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) Great Bear
(iii) Constellation	(c) Moon
(iv) Satellite of the Earth	(d) Mars

Ans:

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

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

Ans: Venus appears in the western sky just after sunset as a evening star.

8. Name the largest planet of the solar system.

Ans: Jupiter is the largest planet of the solar system.

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

Ans: A group of stars which forms a recognizable pattern or shape is called a *constellation*.

Name of two constellations are - 1. Ursa Major (Great Bear) 2. Orion the hunter

10. Draw sketches to show the relative positions of prominent stars in

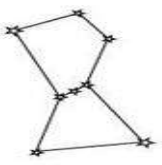
(a) Ursa Major (b) Orion.

Ans:

(a) Ursa Major appears like a big dipper.

Ursa Major

(b) Orion appears like a hunter.



Orion

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

Ans: Satellites and Asteroids are the two objects other than planets which are members of the solar system.

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

Ans: To locate the Pole Star we have to look towards the northern part of the sky and try to identify Ursa Major. We have to look at the two stars at the end of Ursa Major. A straight line passing through these stars is imagined and is extended towards the north direction. This line leads to a star which is not too bright. This is the Pole Star.

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

Ans: No, no star moves in sky. They appear to move from east to west, because the Earth rotates from west to east about its axis.

14**. Why is 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 ?**

Ans: The distance of stars is so large that it cannot be expressed in terms of kilometers. That is why very large distances are expressed in another unit known as light year. One light year is the distance travelled by light in one year.

If the distance of a star is eight light years, it means that this distance is the distance travelled by light in one year.

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

Ans: If the radius of the Earth is r.

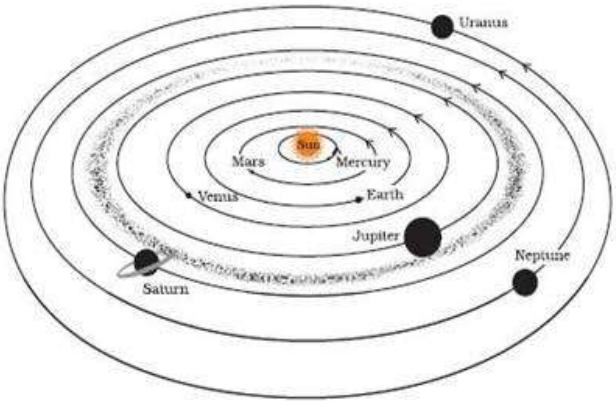
Radius of the Jupiter = 11 r.

$$\therefore \text{Volume of Jupiter} = \frac{4}{3}\pi (11\,r)^3 = 1331\left(\frac{4}{3}\pi r^3\right)$$

$$\therefore \frac{\text{Volume of Jupiter}}{\text{Volume of Earth}} = \frac{1331\left(\frac{4}{3}\pi r^3\right)}{\left(\frac{4}{3}\pi r^3\right)}$$

So, 1331 Earth can accommodate within the Jupiter.

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



Ans: The positions of Mars and Venus have to be interchanged. Similarly positions of Neptune and Uranus also have to be interchanged.