

Answers to Exercises

- A.
- The light year is a unit of distance. It is the distance travelled by light in one year.
 - All stars are huge balls of hydrogen and helium gases. In a star, hydrogen gets converted into helium. In this reaction, a large amount of energy is liberated. This is the source of the heat and light of a star.
 - The distribution of the stars in a galaxy can give it a shape. Galaxies can have different shapes such as spiral, elliptical and ring.
 - The seven brightest stars in the Great Bear form the shape of a dipper (a long-handled spoon used for drawing out water). Together, these stars are called the Big Dipper or Saptarshi.
 - The four planets closest to the sun—Mercury, Venus, Earth and Mars—are called terrestrial (earthlike) planets because they are small and rocky, like the earth.
 - Jupiter, Saturn, Uranus and Neptune have rings around them.
 - The huge spot on Jupiter is actually a huge storm, which has been raging on Jupiter for more than 300 years. It can only be seen through a powerful telescope.
 - Pluto, which was previously thought to be a planet, is now considered a dwarf planet. Ceres is another dwarf planet.
 - At the time of its formation, a dwarf planet could not pull in all other objects near its orbit. So it is not considered a planet.
- B.
- Stars are celestial bodies that produce their own heat and light. Planets and their moons shine by reflecting the light of a star such as our sun. A planet is a round body that orbits the sun. While stars twinkle, planets shine with a steady light.
 - Constellations are imaginary. A group of stars which seem to form a pattern is called a constellation. On the other hand, galaxies are real things in which stars and other celestial bodies are held together by gravitational force.
 - The pattern of stars shown in Figure 13.3 (b) belongs to the Big Dipper in the Great Bear (Ursa Major) constellation. The two brightest stars of the Big Dipper are called 'pointers' because they point towards the pole star, which seems fixed above the north pole.
 - Asteroids are small, irregular, rocky bodies which revolve around the sun in a belt between the orbits of Mars and Jupiter. This belt is called the asteroid belt. Asteroids are also called minor planets. They can measure a few metres to hundreds of kilometres in width. Some asteroids even have moons.
 - Meteoroids are rocks which orbit around the sun. When they enter the earth's atmosphere, they get heated because of friction with the air, and start burning. Meteoroids which fall on a planet or a moon are called meteorites. Meteorite hits are more common on those planets and moons which have little or no atmosphere to burn off the falling rock. The craters on our moon have resulted from meteorite hits.
 - A comet is a small body of ice and dust that moves around the sun in an elongated orbit. As a comet approaches the sun, it heats up and leaves behind a stream of hot, glowing gases and dust particles. We see this as the 'tail' of the comet.
- C.
- The earth is the only planet on which life is known to exist. The planet's distance from the sun, the composition of its atmosphere and the fact that liquid water is found on it make life possible here. Were it nearer the sun, the water on it would have evaporated. Were it farther away, all our oceans, rivers and lakes would have frozen. The carbon dioxide in the earth's atmosphere plays two important roles. Plants use it to make food, which feeds, directly or indirectly, all animals. It also traps just enough heat to ensure that the nights on earth do not become freezing cold.
 - Sunlight lights up half of the moon. As the moon revolves around the earth, we see different parts of the sunlit half. When the entire side facing the earth is sunlit, the moon appears as a full disc. We call this the full moon or *purnima*. And when the side of the moon facing us gets no sunlight, we do not see the moon. This is called the new moon or *amavasya*. After the new moon, the moon appears as a crescent. As days pass, we see larger portions of the moon till the full moon appears. After this, the size of the moon visible to us gradually decreases till we once again have the new moon. The whole cycle of one new moon to the next takes 29.5 days.
- D.
- big bang
 - 100
 - east to west
 - spiral
 - great mass
 - gases
 - carbon dioxide
 - Mercury