

Chapter- 11

Our Earth and Its Neighbours

STUDY NOTES

LET'S LEARN

The Planets, The Earth, The Sun, The Moon and The Stars

The earth is made up of land, water and air. About three-fourths of the earth's surface is water and one-fourth are land. The earth is surrounded by a layer of air.



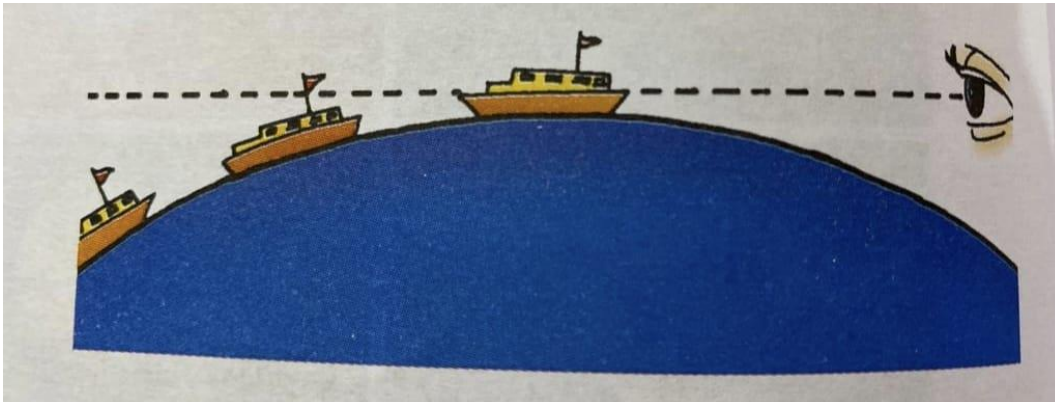
THE PLANETS

- The earth is 150 million km away from the sun. It is one of the eight planets that go around the sun.
- The eight planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- The Sun and these eight planets together form our **solar system**.
- Planets do not have a light of their own.
- They reflect the sunlight that falls on them. This makes planets glow.
- The earth seems very big to us. However, compared with the sun and some other stars, it is very small.
- More than one million earths could feed inside the sun.

THE SHAPE OF THE EARTH

- Long ago, people thought that the Earth was flat. Now there is proof to show that the earth is round.
- Have you watched in movies or in actually seen a ship sailing away? How does it go out of sight?
- The lower part disappears first and the top disappears last. This is because it is sailing

on a curved surface.

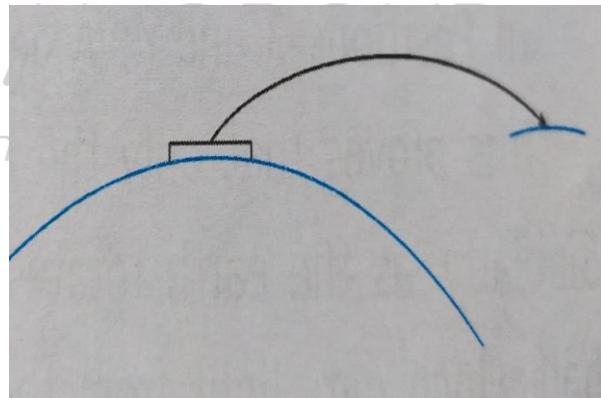


THE EARTH IS ROUND

- Hundreds of years ago sailors had proved that the earth is round.
- They started sailing from certain point, sailed on and on and reached the same point from where they have started.
- This can happen only if the path is circular.
- Photographs taken on space trips show that the earth is round.
- American astronauts who landed on the moon in 1969 saw that the earth appears round from the moon.
- However, the earth appears flat to us. This is because what we see only a tiny part of a very big arc.



THE EARTH APPEARS LIKE A BALL WHEN SEEN FROM THE MOON

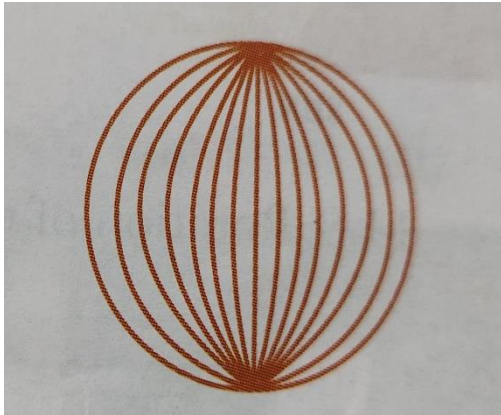


A SMALL PART OF A BIG ARC APPEARS STRAIGHT

MOVEMENTS OF THE EARTH

- When the bangle was spinning there was an axis. This was not real.
- The axis is an imaginary line on which the bangle was spinning.

- Similarly, the earth moved on its axis. This movement is called **rotation**.
- **The earth spins from west to east.** The earth axis is slightly tilted.
- The earth completes one rotation in about 24 hours. That makes a complete day.



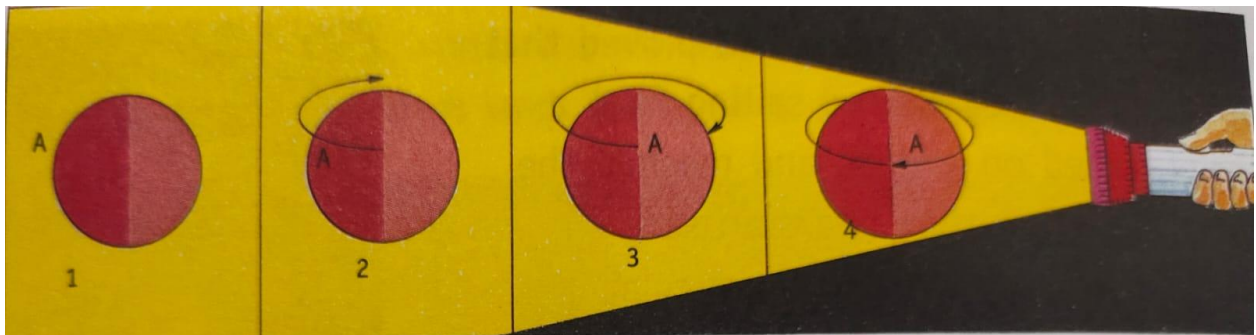
A BANGLE APPEARS TO SPIN ON AN
AXIS



ROTATION OF THE EARTH ON ITS FIXED
IMAGINARY AXIS

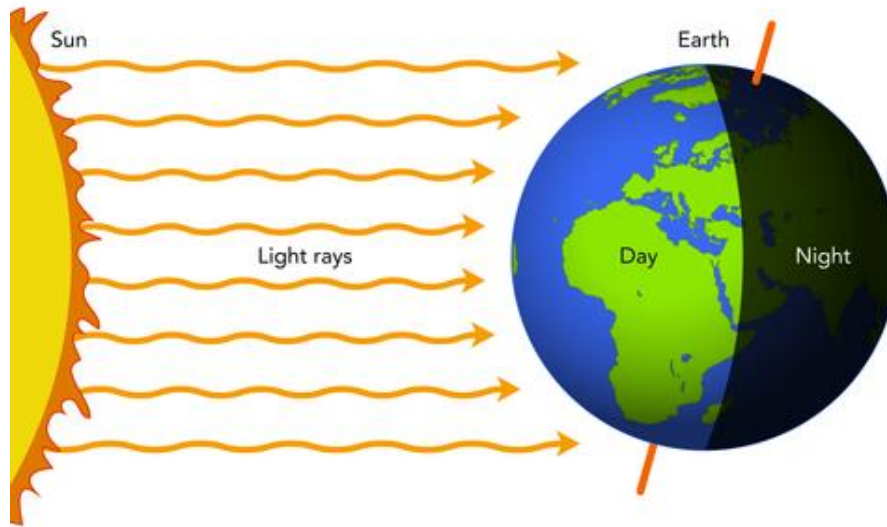
ROTATION CAUSES DAY AND NIGHT

- What happens when a rubber ball rotates in the light of a torch?



THE PART OF THE BALL THAT FACES THE TORCH GETS LIGHT

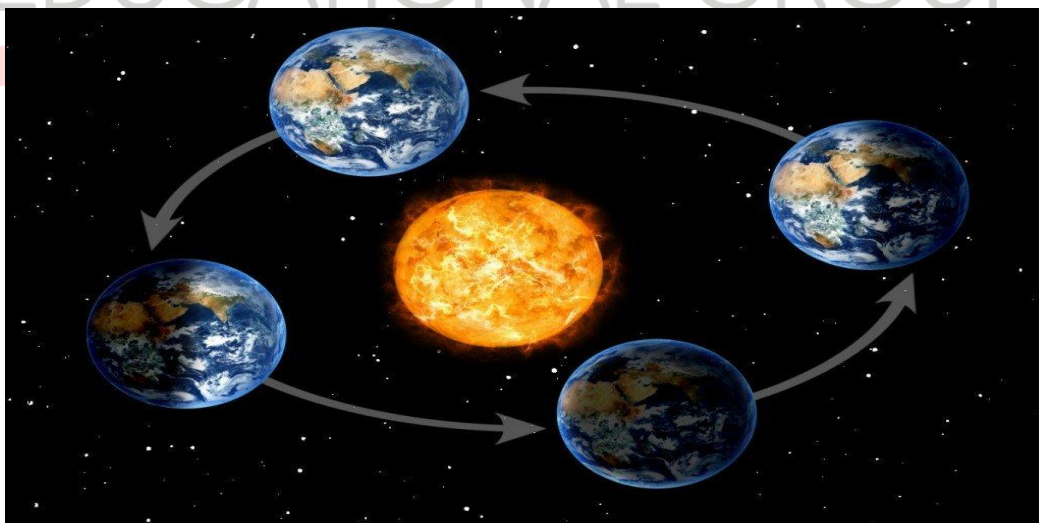
- In position 3 and 4 A gets light.
- This proves that only the half of the ball which faces the torch gets light.
- Similarly, as the earth rotates from west to east, half of it faces the sun.
- This half which gets light from the sun has day. The other half which does not get from the sun has night.
- The earth goes on rotating. Day changes into night, and night changes into day.
- Thus, **the rotation of the earth on its axis causes days and nights.**



ROTATION OF THE EARTH CAUSES DAYS AND NIGHTS

REVOLUTION

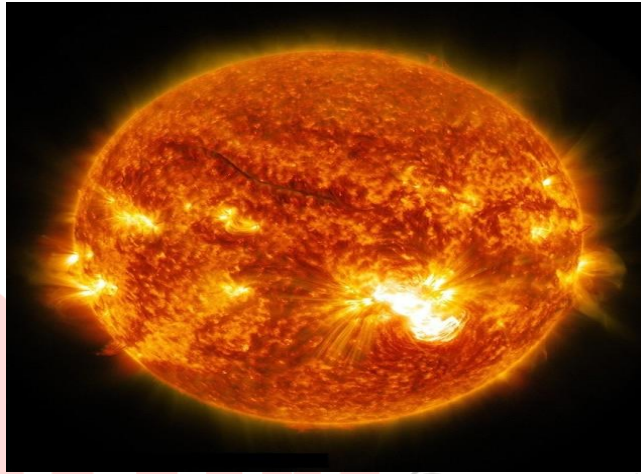
- The other movement of the Earth is its revolution.
- While the earth spins on its axis it also goes around the sun in a fixed path. This fixed path is called orbit.
- The time taken by the earth to complete one revolution around the sun is 365¼ days.



THE REVOLUTION OF THE EARTH AROUND THE SUN

THE SUN

- The sun is a very big ball of hot gases. It is the star closest to the earth.
- It has its own light and heat.
- The earth and the other planets go round the sun.
- They get some of the sun's heat and light.
- The temperature on the sun surface is about 5400°C.
- On a very hot day, the temperature on the earth can go up to 50°C.



THE SUN

THE MOON

- The moon is a natural satellite of the earth because it moves around the earth.
- The moon completes one rotation on its axis in 27 $\frac{1}{3}$ days.
- It takes the same time to complete one revolution around the earth.
- The moon is about 3,84,400 km away from the earth.
- It has no light of its own and shines only because it reflects a light of the sun.



THE MOON

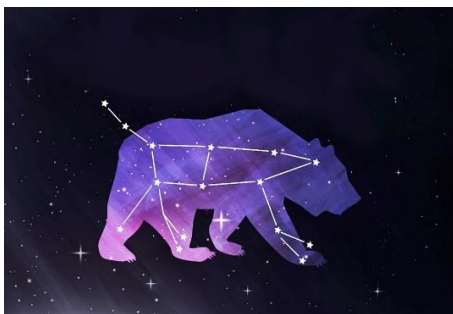
- From the earth we see only those parts of the moon that are lit by the sun.
- Due to changes in the position of the earth, the moon appears to change its shape.
- When the moon is between the Earth and the Sun, we do not see it at all. This is called the new moon.
- In two or three days' time, the moon looks like 🌙. This is the crescent moon.
- Within a week we see half of the Moon called the first quarter. When we see more than half of the moon it is called the gibbous moon.
- In two weeks' time we see the full moon.



PHASES OF THE MOON

THE STARS

- Stars are huge heavenly bodies that have a light of their own.
- For thousands of years, people have enjoyed watching the stars.
- Some stars form patterns in the sky.
- One group of stars appears in the shape of a hunter and other as the outline of a lion and so on. These groups of stars are called **constellations**.
- There are about 88 different constellations.
- Some of the constellations are Ursa Major (The great bear), Scorpius (Scorpion), Orion (Hunter) and Leo (lion).
- On a clear, starry night, we can find different constellations.



URSA MAJOR



SCORPIUS



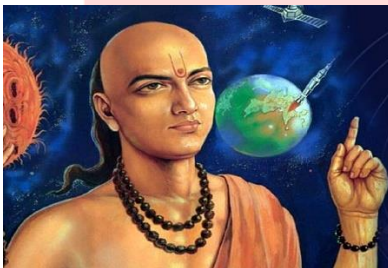
ORION



LEO

INDIAN ASTRONOMERS

- **Astronomer** are people who study the sun the moon the stars and the planets.
- About 1500 years ago there lived in our country an astronomer named **Aryabhata**.
- He studied and taught astronomy and mathematics.
- He was the first man to say that the Earth is round and that it rotates on its own axis.
- He also told us that the moon does not have its own light and it shines when sunlight falls on it.
- **Varahamihira** was another astronomer who lived during the times of Aryabhata.
- He was a scholar and wrote many books.
- **Bhaskara** who was an astronomer. He lived about 900 years ago.
- He discovered a method to work out how planets move.



ARYABHATA



VARAHAMIHIRA



BHASKARA

- **Sawai Jay Singh** the king of Amber built **Jantar Mantar** to study stars.
- Some instruments made of lime and plaster even today can help measure time and the position of the stars.



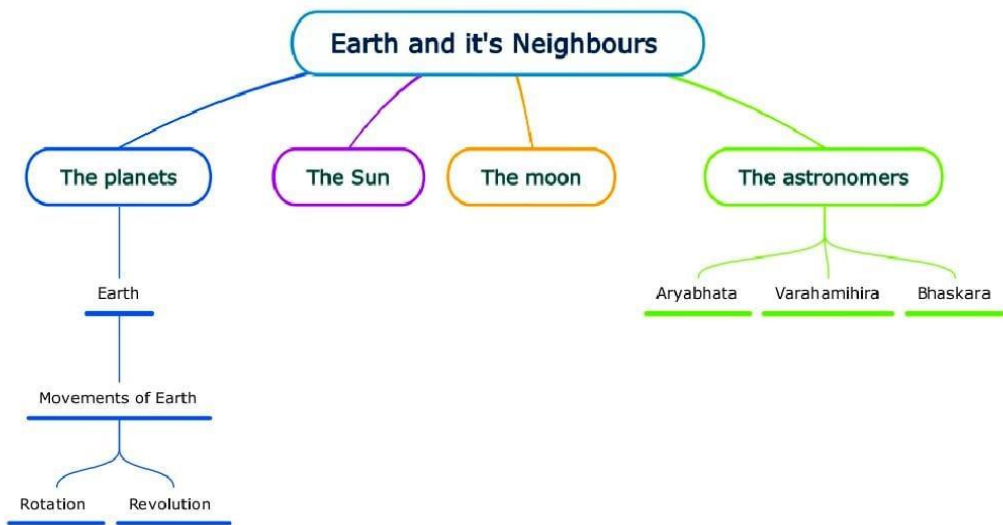
KING SAWAI JAY SINGH



JANTAR AMNTAR, NEW DELHI



MEMORY MAP



Teacher's note

- Make a spacecraft by using the waste materials.

Improve your G.K.

- Earth is known as watery planet.
- One million earths can fit inside the sun.

- Mars is known as red planet.
- The revolution of the earth causes seasons.
- Earth is about four times wider than the moon.

Let's know more:

I. Choose the correct answer.

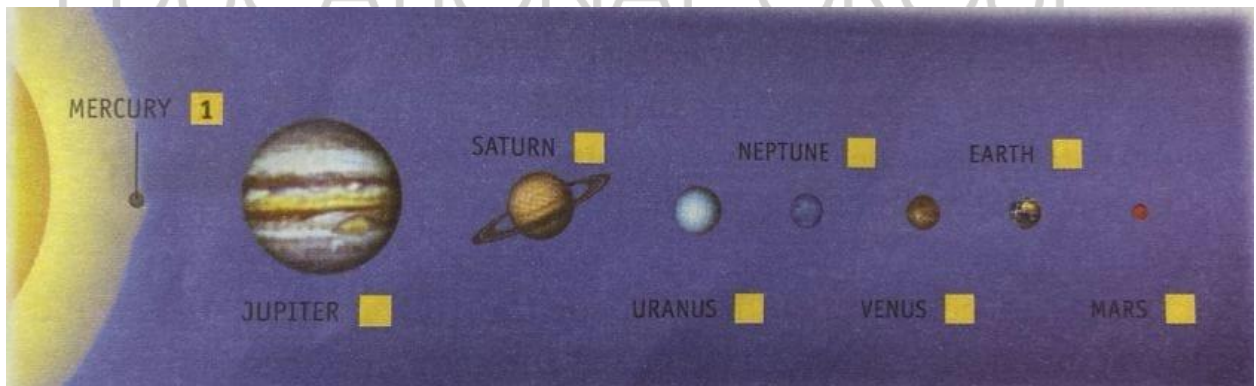
1. The sun and the (eight/nine) planets together form our solar system.
2. The earth spins from (west to east/east to west/north to south).
3. Days and nights are caused due to (rotation/revolution).

Let us answer:

A. TICK (√) THE CORRECT ANSWER.

1. These do not have a light of their own.
 - a. Stars
 - b. planets
 - c. stars and planets
2. This has a shape similar to the earth.
 - a. a football
 - b. a shoebox
 - c. a square table top
3. Constellations are the patterns formed by
 - a. planets
 - b. stars
 - c. moons
4. He was the first astronomer to inform the world that the earth is round
 - a. Bhaskara
 - b. Varahamihira
 - c. Aryabhata

B. The Planets got mixed up. Number these planets in the increasing order of there distance from the sun. Mercury is numbered 1.



C. Write the time taken for one.

1. Rotation of the earth on its axis -----
2. Revolution of the earth around the sun -----
3. Rotation of the moon around the earth -----

D. Answer these questions:

1. Why does the earth appear flat to us?
2. What does the rotation of the earth cause?
3. The moon is visible in the sky because of the sun. How?
4. Name any three constellations.
5. Who are astronomers?

ANSWER KEY**I.**

1. Eight
2. West to east
3. Rotation

A.

1. Planets
2. Football
3. Stars

B.

- JUPITER – 5
SATURN – 6
URANUS – 7
NEPTUNE – 8
VENUS – 2
EARTH – 3
MARS – 4

C.

1. 24 hours
2. 365 $\frac{1}{4}$ days
3. 27 $\frac{1}{3}$ days

D.

1. The earth appears flat to us because the part of the earth that we see is only a tiny part of a very big arc and the tiny part of a big arc appears straight.
2. The rotation of the earth causes day and night.
3. Moon does not have its own light. It is visible in the sky only because it reflects the light of the sun.
4. The three constellations are Ursa Major, Leo and Orion.
5. Astronomers are people who study the sun, the moon, the stars and the planets.

