CHAPTER 2

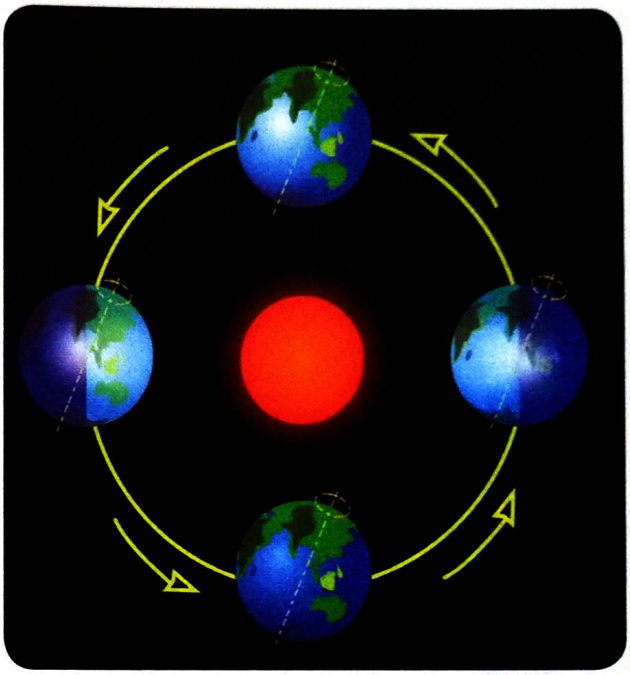
MOTIONS OF THE EARTH

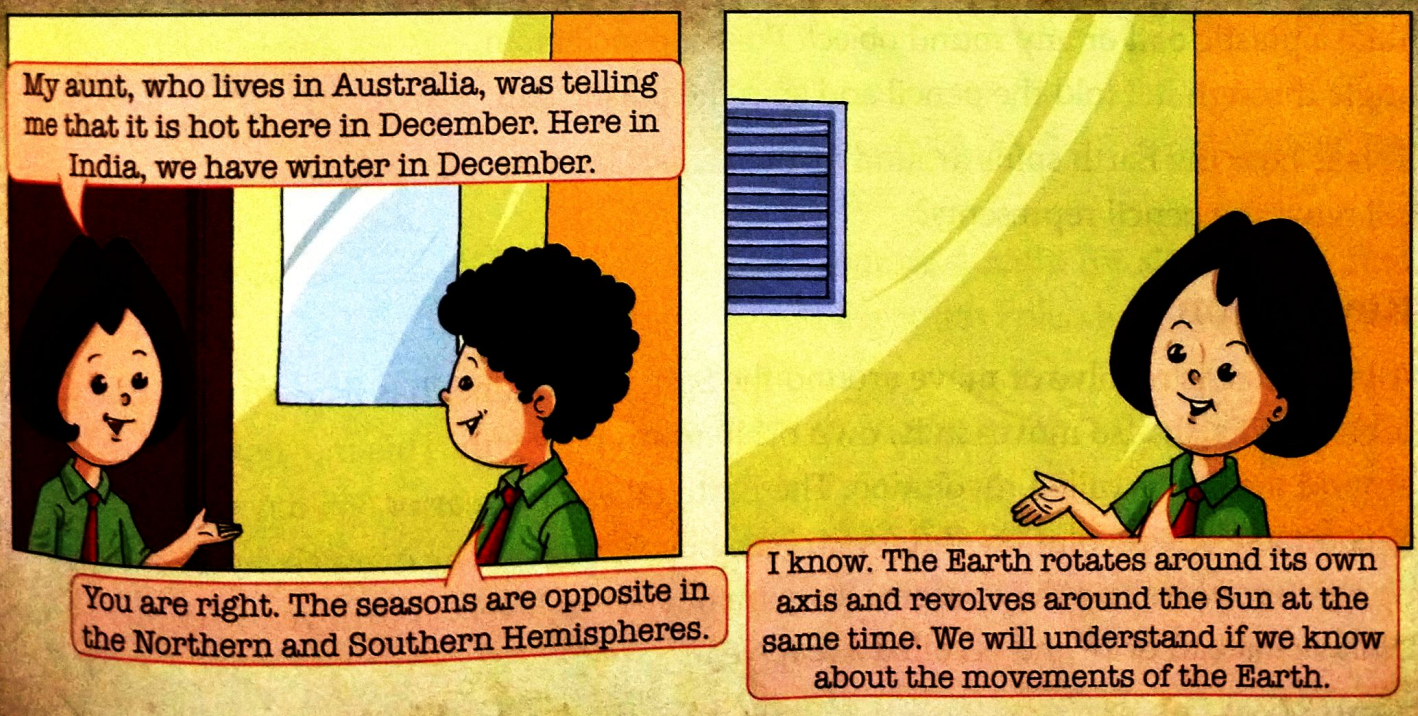
Let's CRACK it

We have already learnt about the two movements of the Earth.

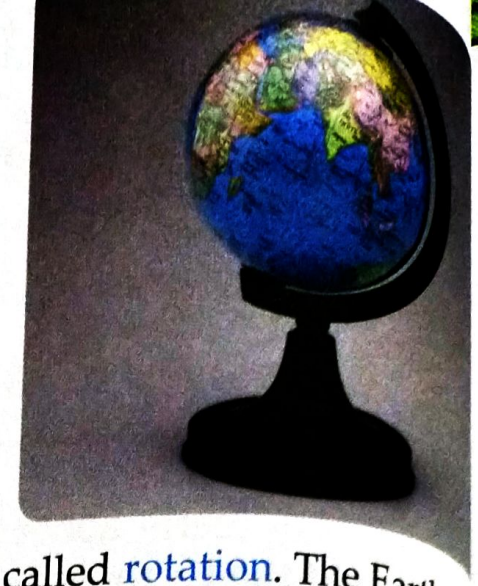
Can you name them?

1. Rotation
2. Revolution





The Earth's Axis



All of us are aware of how a globe looks. You must have seen the Earth is tilted at an angle in the globe. There is an imaginary line that passes through the globe tilting it. This is the Earth's axis. The Earth's axis runs through its centre on which the Earth spins. It is tilted at an angle of 23½°. It runs from the North Pole to the South Pole.

Rotation

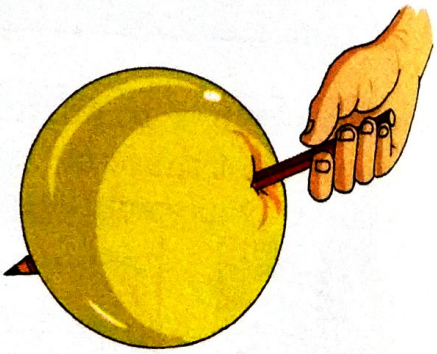
The Earth continuously spins on its axis like a top. This is called rotation. The Earth takes approximately 24 hours to complete one rotation.

The rotation of the Earth causes day and night. As the Earth rotates, the half facing the Sun has day and the other half, which is in darkness, has night. It rotates from west to east. We see the Sun appear to rise and move across the sky every day. But it does not really move; it only seems to move! The Earth is spinning round and round and we are moving around with the Earth. The places in the east get sunlight before the places in the west. Thus, Japan which is in the extreme east gets daylight first and is called the Land of the Rising Sun.

Last country to receive sunlight American Samoa

Let us do an activity to understand this.

Take a plastic ball or any round object. Push a pencil at an angle through it. Hold the pencil and spin the plastic ball.



This is how the Earth spins around its own axis. Can you tell what the pencil represents?

Revolution

All the planets revolve or move around the Sun. Each planet has its own path called an orbit. The Earth also moves in its own orbit around the Sun. This movement of the Earth around the Sun is called revolution. The Earth takes one year or 365 days and 6 hours to complete one revolution. But a year has only 365 days. The extra six hours are added up for four years and they become an extra day. Thus, every fourth year, February has 29 days instead of 28 and is called a leap year.

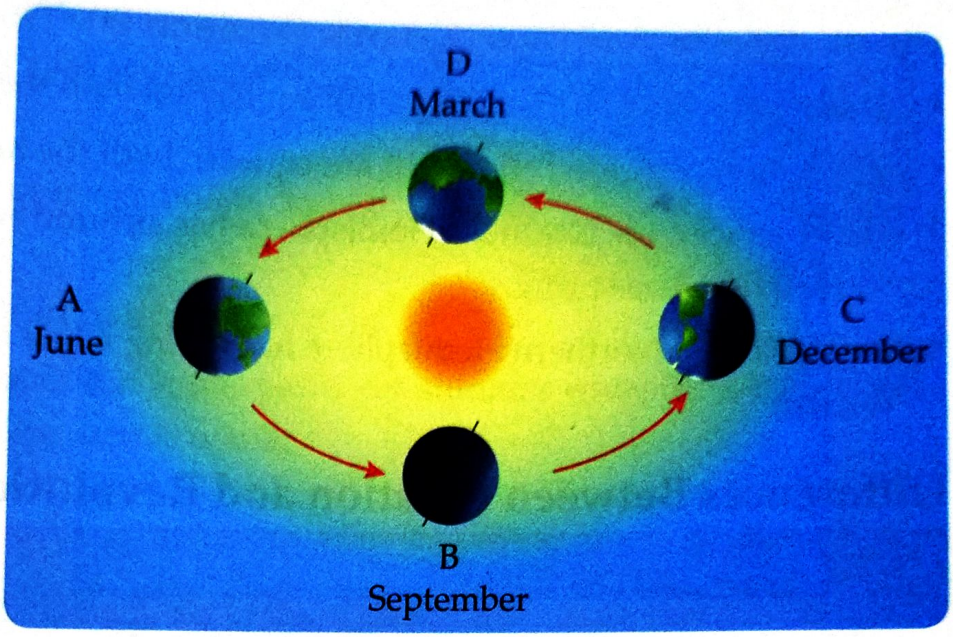
Fun
FACT

Every planet has a different duration of revolution.

Change of Seasons

The most important effect of revolution is the change of seasons—summer, autumn, winter and spring. As the Earth revolves around the Sun, many parts of the Earth experience changing seasons.

Look at the diagram given.



The Earth takes 365 days and 6 hours to orbit the Sun.

The Earth's axis always tilts in the same direction. The hemisphere tilted towards the Sun experiences summer while the hemisphere tilted away from the Sun experiences winter.

June (Position A)

- The Northern Hemisphere is tilted towards the Sun. Hence, it experiences summer. The Southern Hemisphere experiences winter.
- The rays of the Sun fall directly on the Tropic of Cancer. So, the days are longer and the nights are shorter in the Northern Hemisphere.
- The Sun shines on the North Pole continuously for six months for all 24 hours. This is called the Polar Day or the Midnight Sun. At the South Pole, the Sun is not visible for six months. This is called the Polar Night.

December (Position C)

- The Southern Hemisphere is tilted towards the Sun. So it experiences summer and the Northern Hemisphere will have winter. That is why the month of December is cold in India and hot in Australia.

- The rays of the Sun fall directly on the Tropic of Capricorn. So, the days are longer and the nights are shorter in the Southern Hemisphere.
- The Sun shines on the South Pole continuously for six months for all 24 hours. So, it experiences the Polar Day or the Midnight Sun. The North Pole experiences the Polar Night.

September (Position B) and March (Position D)

- During this time, the Sun's rays fall equally on both the hemispheres.
- The length of the day and night are equal in both the hemispheres.
- In September, the Northern Hemisphere has autumn while the Southern Hemisphere has spring.
- In March, the Northern Hemisphere has spring while the Southern Hemisphere has autumn.

Differences Between Rotation and Revolution

ROTATION	REVOLUTION
It is the movement of the Earth on its axis.	It is the movement of the Earth around the Sun.
The Earth takes 24 hours to complete one rotation.	The Earth takes 365 days and 6 hours to complete one revolution.
Rotation causes day and night.	Revolution causes change of seasons.

The movements of the Earth are vital to life on the Earth. Suppose the Earth stopped spinning one day. What do you think would happen? Think of as many changes as you can.

Now WE KNOW

- The Earth's axis is an imaginary line running through its centre on which the Earth spins.
- The Earth is constantly moving. It rotates around its axis causing day and night.
- It revolves around the Sun. One revolution takes 365 days and 6 hours.
- The most important effect of revolution is change of seasons.
- The Earth's axis always tilts in the same direction.
- The hemisphere tilted towards the Sun experiences summer while the hemisphere tilted away from the Sun experiences winter.

WORD Wise

axis: an imaginary line running through the centre of the Earth

rotation: the movement of the Earth around its axis

orbit: the fixed path of a planet around the Sun

revolution: the movement of a planet around the Sun

Let's CHECK

A. Choose the correct option.

1. The axis of the Earth is tilted.
   a) curved b) tilted c) straight
2. Rotation causes day and night.
   a) revolution b) rotation c) season
3. The Earth rotates from west to east.
   a) east to west b) west to east c) north to south
4. A revolution of the Earth around the Sun takes 365 days and 6 hours.
   a) 365 days b) 366 days c) 365 days and 6 hours
5. If it is summer in the Southern Hemisphere it would be winter season in the Northern Hemisphere.
   a) summer b) winter c) spring

B. Fill in the blanks.

1. A leap year has 366 days.

2. Japan is called the Land of the Rising Sun.
3. Each planet has its own path around the Sun called an orbit.
4. One rotation of the Earth takes 24 hours.
5. During Spring and Autumn it is neither hot nor cold.

C. State whether true or false.

1. The Sun rises in the west and sets in the east. False
2. One revolution of the Earth around the Sun takes one year. True
3. Rotation causes seasons. False
4. The Earth is continuously in motion. True
5. The Northern and Southern Hemispheres experience the same seasons at the same time throughout the year. False

D. Answer the following questions.

1. Name the two movements of the Earth.
2. Explain rotation.
3. Explain revolution.
4. Describe the Earth's axis.
5. How are seasons caused?
6. Explain why Polar Day and Polar Night are caused.
7. Explain why the South Pole has winter in the month of June.
8. Give any three differences between rotation and revolution.

QUIZ

Time

Unscramble the words.

1. NSOASE SEASON
2. ORTOINTA ROTATION
3. ISXA AXIS
4. OPEACCK PEACOCK