

10

MOVEMENTS OF THE EARTH

In this chapter, we will learn about:

- Shape of the Earth
- Earth's spin
- Revolution of the Earth



SHAPE OF THE EARTH

Ancient people believed that the Earth was flat. Therefore, the ships reaching the far ends would fall down and would not come back. In 1519, a Portuguese explorer Ferdinand Magellan started his sea journey from Spain and after travelling through the sea for two years, his ship again reached Spain. This journey proved for the first time that the Earth is not flat but it is round like a football.

Picture sent from satellites in space also shows Earth as a huge sphere (Figure 10.1).



Figure 10.1: Our Earth



Activity 10.1

- Take a world globe, carefully observe it. Different countries are painted in different colours, while the seas are all painted blue.
- Find Lahore. Put your finger on Lahore and start moving your finger around the globe in one direction only.
- Can you go around the globe and come back to Lahore?
- What does this prove?
It proves that the Earth is round and not flat.
- Would it be possible to start from Lahore, travel in only one direction and come back to Lahore if Earth was flat?



Activity 10.2

Material: Football, wooden block or box, three small plastic dolls, plasticine.

Procedure: Fix plastic dolls with plasticine at positions A, B and C on the football and observe from some distance away.

1. Do you see all parts of each doll on the football at the same time?

Now fix the plastic dolls at positions A, B and C on the flat wooden block and observe from some distance.

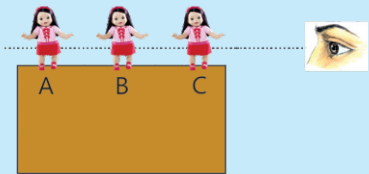
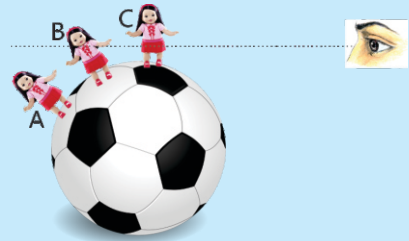
- (i) Do you see all parts of each doll on the wooden block at the same time?

- (ii) Why cannot you see all the dolls completely on the football?

- (iii) Why can you see all the dolls completely on the block?

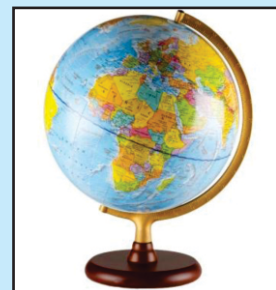
2. Can you tell why we first see the chimneys of a ship approaching the seashore?

3. What do you conclude about the shape of Earth from these observations?



Activity 10.3

An aeroplane flies towards East (Route-A) from Lahore and reaches Los Angeles (a city of USA). Other airlines fly towards West (Route-B) from Lahore and also reach Los Angeles.



1. Take a world globe.
2. Mark Lahore and Los Angeles on it.
3. Trace path with your finger leaving Lahore towards East and write the names of three countries on the way for route-A.

4. Now trace path going towards West and name three countries

on the way for route-B.

5. What do you conclude from the above activity?

SPIN OF EARTH – DAYS AND NIGHTS

It was the old belief that the Earth was stationary while the Sun and the Moon were revolving around it. The occurrence of days and nights was due to their motion. Later, when it was found that Earth is round, this idea was found to be wrong.

By carefully observing the motions of other stars, scientists were able to prove that the Earth we are standing on is not only circling around the Sun but is spinning about its own axis as well.

Just like a top rotating about its pin (Figure 10.2), the Earth rotates about its axis. This rotation is known as spin of the Earth (Figure 10.3). The axis is an imaginary line passing through the north and south poles of the Earth.

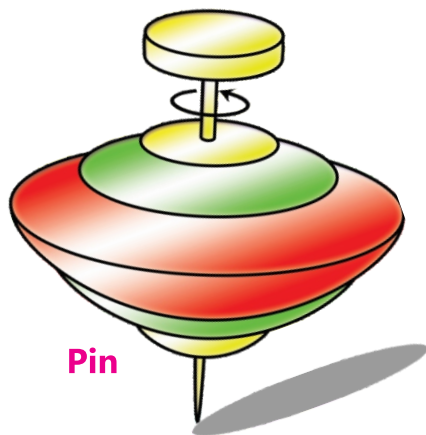


Figure 10.2: Top

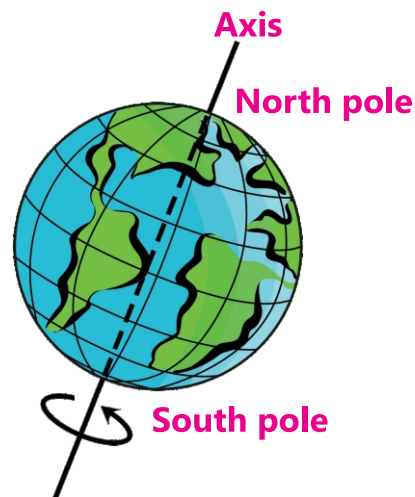


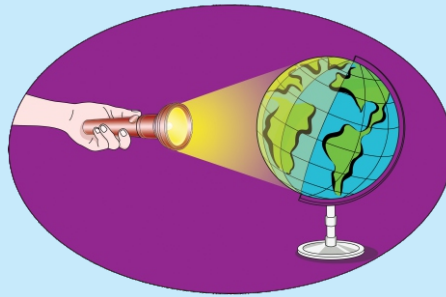
Figure 10.3: Spin of the Earth

The occurrence of days and nights is due to the spin of the Earth. The Earth rotates from west to east. That is why the Sun appears to rise in the east and sets in the west.



Activity 10.4

Place a globe on a table, throw light on one side of the globe from a torch. One half of the surface of globe will be lighted up while the other half will remain dark. Rotate the globe slowly. The part being exposed to light will be brightened while the other part will go into darkness.



Our Earth also rotates in front of the Sun in the same way. There is day in the half part of the Earth that is lighted up by the Sun and there is night in the other half not facing the Sun.

Days and nights are caused by the spin of the Earth about its axis.

The Earth completes its one rotation about its axis in 24 hours, so the total duration of one day and one night is 24 hours.

REVOLUTION OF THE EARTH – THE YEAR

When a body is circling around another body, it is said that the first body is revolving around the other body.

One complete round trip of a body around another body or a point is called a revolution.

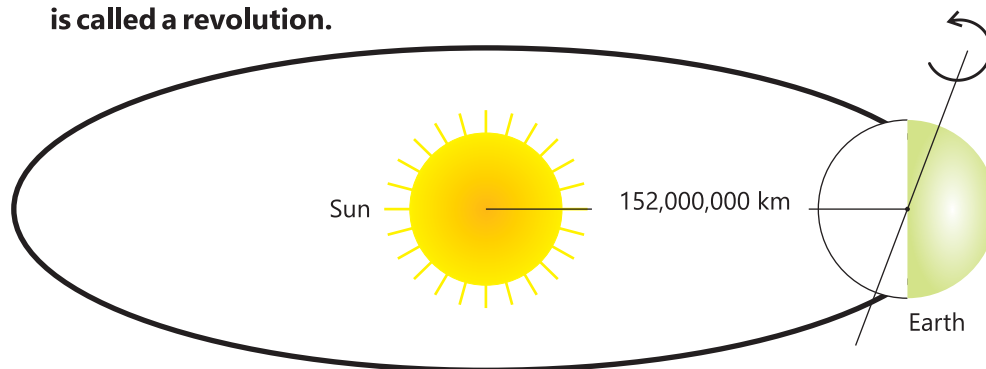


Figure 10.4: Revolution of the Earth

As mentioned earlier, the Earth also revolves around the Sun (Figure 10.4). This is called orbital motion of the Earth. The path of its orbital motion is nearly a circle of radius 152 million kilometres. The Earth completes one revolution around the Sun in about 365 days. This time is also called a **year**.

KEY POINTS

- The axis is an imaginary line passing through the north and south poles of the Earth.
- The occurrence of days and nights is due to the spin of the Earth.
- The Earth rotates from west to east.
- The Earth completes its one rotation about its axis in 24 hours.
- The Earth completes one revolution around the Sun in about 365 days.
- One complete round trip of a body around another body or a point is called a revolution.

GLOSSARY

Axis:	An imaginary line passing through the north and south poles of the Earth
Revolution:	One complete round trip of a body around another body or a point

EXERCISE

10.1 Choose the correct answer from the following choices:

- (i) The time taken for one complete rotation of the Earth about its axis is :
- (a) 1 hour (b) 24 hours (c) 36 hours (d) 48 hours
- (ii) The Sun appears to move in the sky. In fact, this motion is due to the:
- (a) motion of the sky (b) motion of the Moon
(c) spinning of the Earth (d) motion of the people on the Earth
- (iii) The axis of the Earth is an imaginary line passing through the:
- (a) north and south poles of the Earth
(b) north and west poles of the Earth
(c) east and west poles of the Earth
(d) east and north poles of the Earth

(iv) The Earth completes one revolution around the Sun in:

- (a) one day
- (b) one month
- (c) three months
- (d) one year

(v) The Earth rotates from :

- (a) north to south
- (b) west to east
- (c) north to west
- (d) east to west

(vi) We experience day and night on the Earth because:

- (a) the Earth is rotating
- (b) the Earth is tilted
- (c) the Earth is round
- (d) the Moon orbits the Earth

(vii) The part of Earth facing away from the Sun is in:

- (a) night time
- (b) day time
- (c) summer
- (d) winter

10.2 Tick the right type of motion against each.

- (i) Movement of a top. Rotation Revolution
- (ii) Movement of an electric fan. Rotation Revolution
- (iii) Motion of Moon around the Earth. Rotation Revolution
- (iv) Whirling of a ball attached to a string. Rotation Revolution
- (v) Motion of the Earth around the Sun. Rotation Revolution
- (vi) Movement of wheel of a bicycle about its axle. Rotation Revolution
- (vii) Movement of horses of merry-go-round. Rotation Revolution

10.3 Answer the following questions:

- (i) How does the spin of the Earth cause day and night?
- (ii) Why is it dark at night?

10.4 Give three examples each for rotation and revolution.

Rotation

Revolution

10.5 How do rotation and revolution of the Earth differ?

Index

A

Air 15
Axle 79

B

Balanced diet 27
Boiling 67
Bones 3
Brain 5

C

Carbohydrates 24
Carnivores 40, 41
Centigrade 65
Circuit 94
Conductors 95
Consumers 41

D

Decantation 58
Decomposers 42
Dengue fever 8
Distance 77

E

Ears 2
Earth 103
Electricity 93
Environment 35, 36
Eyes 2

F

Fahrenheit 65
Fats 25
Filtration 58
Food 14
Food groups 23
Force 72
Freezing 61

G

Gases 50
Growth 16

H

Heart 5
Herbivores 40, 41
Hygiene 29

I

Inclined plane 78
Insulators 95

J

Joints 4

L

Lever 77
Life cycle 18
Light 15
Liquids 50
Lungs 6

M

Machines 72-77
Magnet 96
Magnetism 93
Malaria 8
Mass 45
Matter 47-49
Measurement 64
Melting 61
Milk teeth 2
Minerals 26
Mixture 56
Motion 73
Movement 16
Muscles 4

N

Noise 88

O

Omnivores 40, 41
Organ 1,2
Organisms 18,38

P

Permanent teeth 3
Poles of magnet 97
Pollution 88
Producers 41
Proteins 24
Pulley 78

R

Reproduction 17
Revolution 107
Rural environment 37

S

Skin 6
Solids 49
Sound 83
Speed 77
Spin 106
Stomach 6
Switch 94

T

Teeth 2
Temperature 64
Thermometer 64,65

U

Urban environment 37

V

Vacuum 87
Vitamins 25
Volume 48

W

Water 15, 26
Wheel 79