



Unit - 1 : The Earth



The Globe - A Model of the Earth

The earth is a part of the solar system. It is the only planet where life exists. This is because of the presence of air and water on the earth.

The earth is round in shape. In the beginning, people thought that the earth was flat. They were afraid of going too far to its edges as they thought that would fall off the earth.

Some people in the past tried to prove that the earth was round.

★ Some 450 years ago, **Nicolaus Copernicus**, a famous astronomer of Poland, stated that the earth is not flat but it is round. However, nobody believed him then.

★ Some years later, **Galileo Galilei**, an astronomer of Italy, stated that the earth is round and it revolves around the sun. He, too, was rejected by the people.

★ In 1519, **Ferdinand Magellan**, a famous Portuguese explorer, started his voyage around the world from a place in Spain. He kept on sailing westwards. After three years, in 1522, one of his ships returned to the same place from where he had started his journey. This could be possible only on a round surface. Magellan thus proved that the earth is round. Today, satellite photographs also confirm that the earth is round. The earth looks blue from space because of the presence of water. That is why the earth is also called the '**blue planet**'.

Looking Ahead

In this lesson :

- ★ How to read a globe, important latitudes and longitudes,
- ★ How to read a grid.



Earth looks blue from space



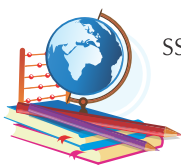
Ferdinand Magellan

Know More

Ferdinand Magellan started his voyage around the world with 277 sailors. Unfortunately he and many of his sailors were killed in Philippines in 1521. Only 19 sailors were able to come back home in 1522 after completing the mission.

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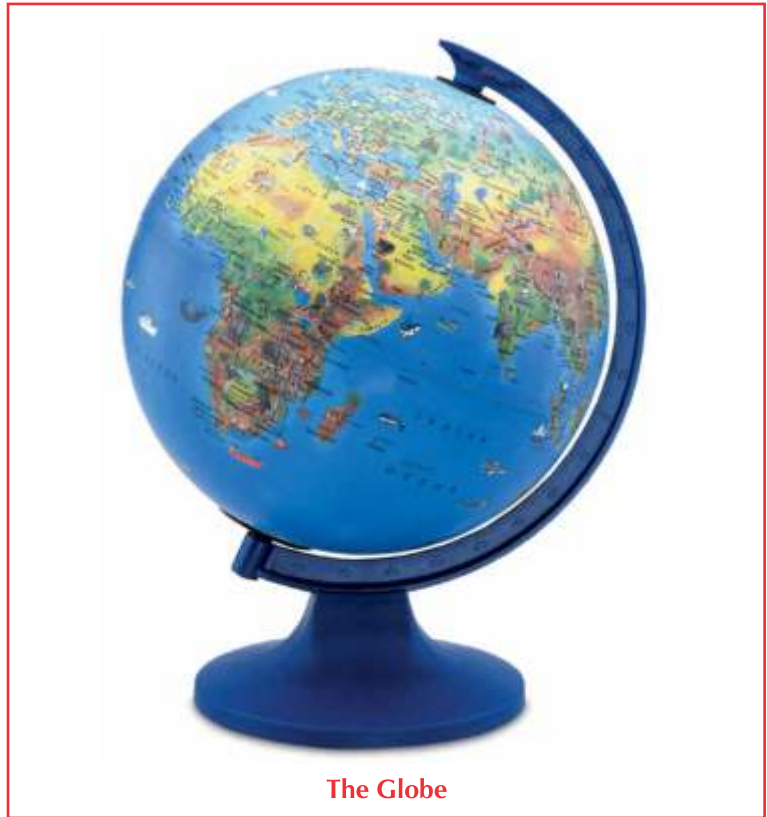


THE GLOBE

The earth's surface is very vast. It is not possible to go to every part of the earth. Then how can we study the surface of the earth! To study the surface of the earth, man has made a globe. A **globe** is a small model of the earth. It gives us an idea of the location of places on the earth.

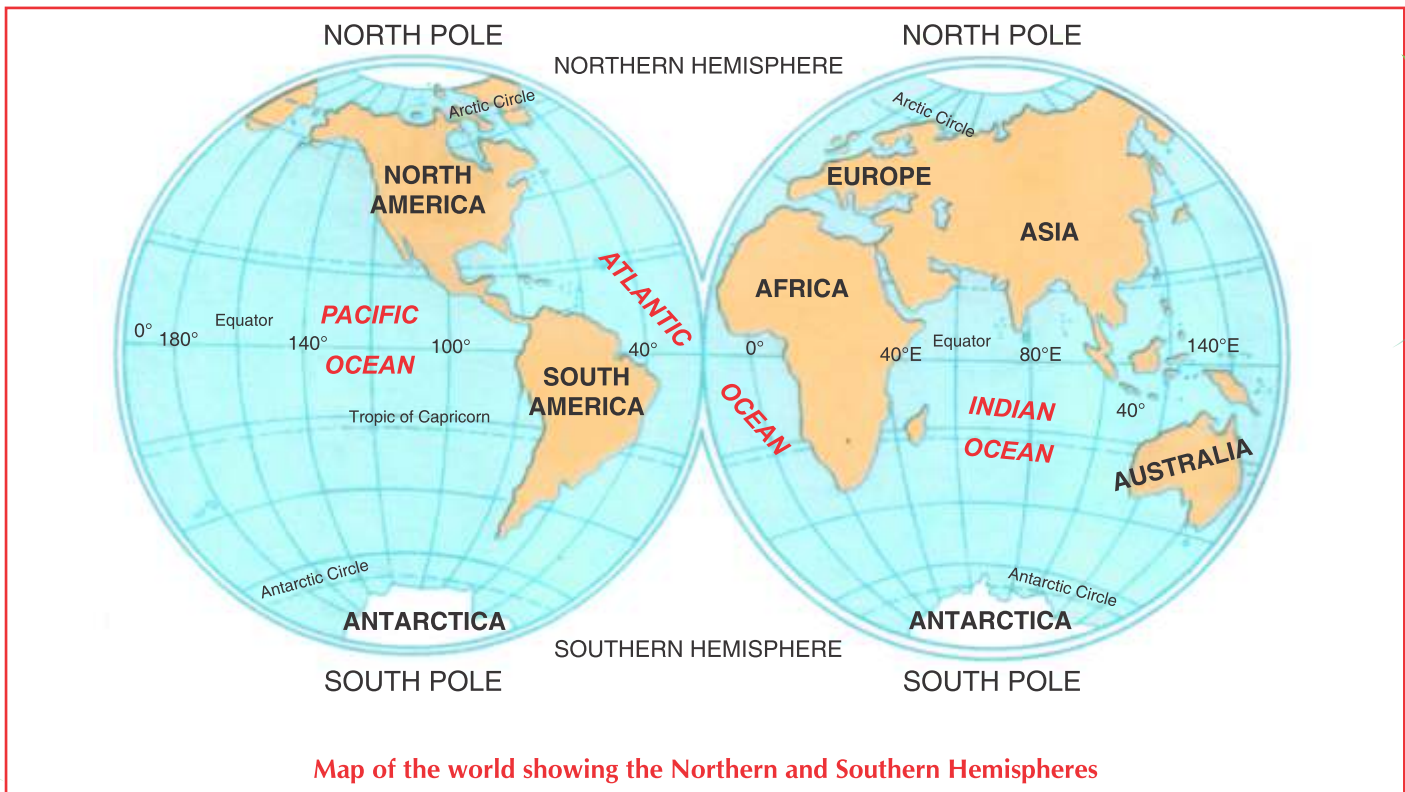
We cannot see all parts of a globe at a time. Only one half of the globe can be seen at a time. We have to rotate the globe to see the other half.

Look at the globe carefully and locate its two end points. The point at the top is called the **North Pole**, the other point at the bottom is called the **South Pole**. The line that joins the two poles is called the **axis**. It is the imaginary line. The axis of the globe represents the axis of the earth on which it rotates.



The Globe

Halfway between the poles is an other imaginary line, called the **Equator**. It divides the earth into two equal halves, called the **Hemispheres**. The half to the north of the Equator is called the **Northern Hemisphere**. The half to the south of the Equator is called the **Southern Hemisphere**.



Map of the world showing the Northern and Southern Hemispheres



Look at the globe further. You will see a network of lines dividing the earth horizontally and vertically. These lines are imaginary. They have been drawn on the globe to locate places correctly.

LATITUDES

The lines that run parallel to the Equator are called **latitudes**. They run from east to west. They form full circles on the globe. These lines are also called **parallels of latitudes**.

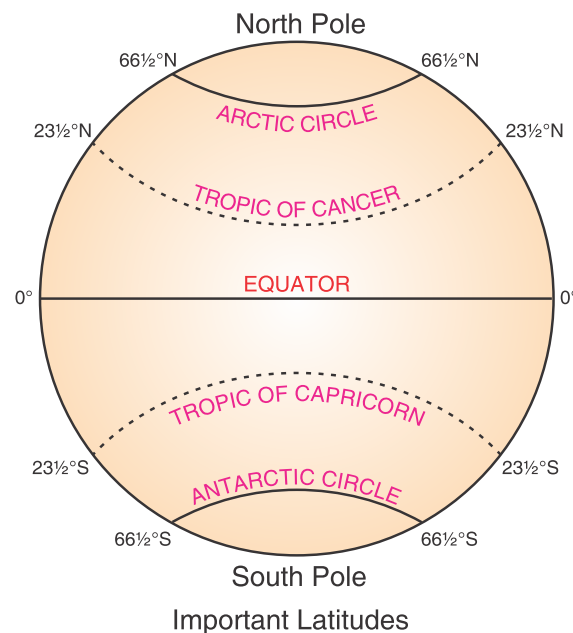
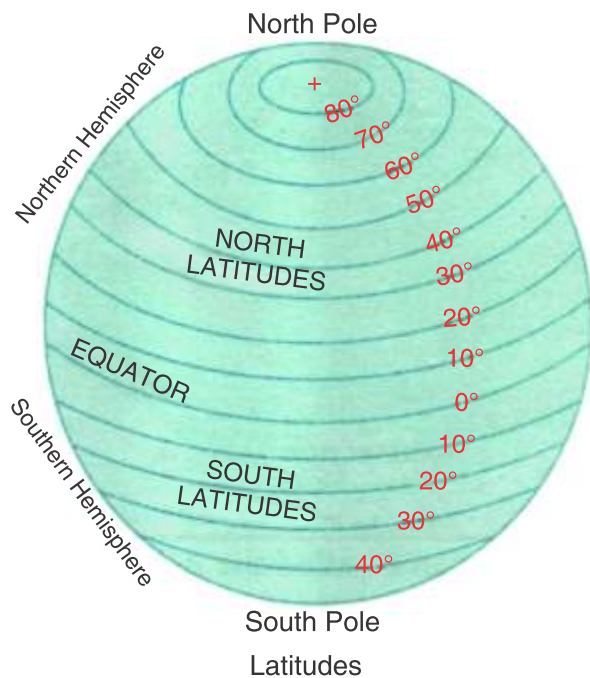
The length of the latitudes keep on decreasing as we go from the Equator towards the poles. The Equator is the **longest** latitude and the poles are the shortest. Since the latitudes are parallel to each other, they are exactly at the same distance from each other.

There are 90 latitudes in the Northern Hemisphere and 90 latitudes in the Southern Hemisphere. So, there are 180 latitudes in all.

The latitudes are marked in **degrees** ($^{\circ}$). The Equator is marked 0° . The other latitudes on either side of the Equator are marked between 0° and 90° . The latitudes on the north of the Equator are labelled as **N** (north), and those on the south as **S** (south). For example, the latitude of the North Pole is **90°N** and the South Pole is **90°S** .

Important latitudes have been given special names. They are :

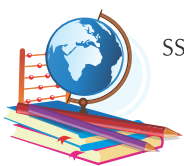
1. The Equator – 0°
2. The Tropic of Cancer – $23\frac{1}{2}^{\circ}\text{N}$
3. The Tropic of Capricorn – $23\frac{1}{2}^{\circ}\text{S}$
4. The Arctic Circle – $66\frac{1}{2}^{\circ}\text{N}$
5. The Antarctic Circle – $66\frac{1}{2}^{\circ}\text{S}$



LONGITUDES

The lines that run vertically on the globe through the poles are called **longitudes** or **meridians**. The longitudes are semi-circles. They meet at the poles. Unlike latitudes, all the longitudes are of **equal length**.

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The maximum distance between two longitudes is at the Equator. Gradually the gap between two longitudes starts decreasing as they move towards the poles where they meet. Like the latitudes, longitudes are also marked in **degrees** ($^{\circ}$). There are **360 longitudes** in all.

The longitude that passes through Greenwich near London has been taken as the starting line. It is marked 0° . It is called the **Prime Meridian** or **Greenwich Meridian**.

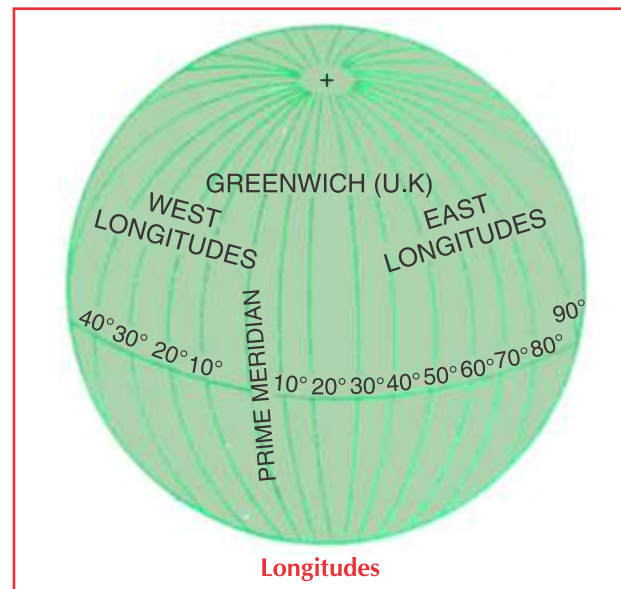
The longitudes to the east of the Prime Meridian are marked **E** (east) and those on its west are marked **W** (west).

So, out of a total of 360 longitudes, 180 longitudes are to the east of the Prime Meridian and 180 longitudes are to the west of it.

Remember that 180° E (east) and 180° W (west) are halfway around the globe. So they superimpose each other and form a single line. This line is known as **180° longitude**. This line has been designated as the **International Date Line**. If the International Date Line is crossed from west to east, a day is added. It means that if it is Monday on the American side, it will be Tuesday on the Asian side. Similarly, if we cross it from east to west, we drop a day. It is, therefore, necessary to make correction of dates, while crossing the International Date Line.

GRID

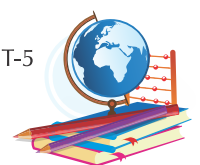
The latitudes and longitudes on the globe intersect each other at right angles, and form a network called the **grid**. The grid helps us to locate places on the globe. For example, the latitude of Delhi is 28.40° N and its longitude is 77.20° E. The location of Delhi will be at the point where the latitude 28.40° N and longitude 77.20° E intersect each other. You can check your findings from the map of India given alongside.



India – Longitudes and Latitudes

Know More

Eratosthenes was the first who proposed a system of latitudes and longitudes for a map in the 3rd century B.C.





WORD MEANINGS

globe : a model of the earth.

latitudes : imaginary lines running east-west.

longitudes : imaginary lines running north-south.

gride : a network of latitudes and longitudes.



LET US RECALL

- A **globe** is a small model of the earth.
- There are two sets of imaginary lines on a globe : the **latitudes** and the **longitudes**.
- The lines running parallel to the Equator are called **latitudes**.
- The lines running from the pole to the pole are called **longitudes**.
- The Equator is the **longest latitude**.
- The 180th meridian is also called the **International Date Line**.
- The grid helps us to locate places on a globe.

TESTING TIME

TASKS FOR FA & SA

(Based on CCE)

A Tick (✓) the correct answer :

1. Who for the first time stated that the earth is round?

(a) Isaac Newton	<input type="radio"/>	(b) Nicolaus Copernicus	<input type="radio"/>
(c) Galileo Galilei	<input type="radio"/>	(d) John Kepler	<input type="radio"/>
2. Which line divides the earth into two equal halves?

(a) Equator	<input type="radio"/>	(b) Tropic of Cancer	<input type="radio"/>
(c) Arctic Circle	<input type="radio"/>	(d) Tropic of Capricorn	<input type="radio"/>
3. How many longitudes are there in all?

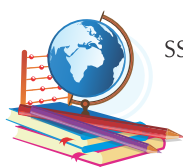
(a) 180	<input type="radio"/>	(b) 360	<input type="radio"/>
(c) 400	<input type="radio"/>	(d) 460	<input type="radio"/>
4. Which meridian has been designated as the International Date Line?

(a) 180th	<input type="radio"/>	(b) 160th	<input type="radio"/>
(c) 150th	<input type="radio"/>	(d) 140th	<input type="radio"/>
5. The Prime Meridian passes through

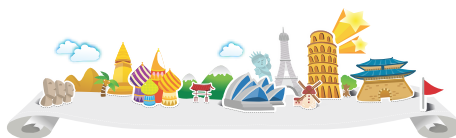
(a) Moscow	<input type="radio"/>	(b) Delhi	<input type="radio"/>
(c) Berlin	<input type="radio"/>	(d) Greenwich	<input type="radio"/>

B Write True or False :

1. The earth is round in shape.
2. The earth looks blue from space.



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3. Greenwich is situated near Paris.
4. 0° longitude is also called the Prime Meridian.
5. Longitudes are also known as parallels.

C. Match the following columns :

<p style="text-align: center; border: 1px solid blue; display: inline-block; background-color: #e0f0ff; padding: 2px;">Column I</p> <ol style="list-style-type: none"> 1. Equator 2. Tropic of Cancer 3. Tropic of Capricorn 4. Arctic Circle 5. Antarctic Circle 	<p style="text-align: center; border: 1px solid yellow; display: inline-block; background-color: #fff9c4; padding: 2px;">Column II</p> <ol style="list-style-type: none"> a. 66½°N b. 66½°S c. 0° d. 23½°N e. 23½°S
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D. Tick (✓) the correct words given in the brackets.

1. The axis is (an imaginary / a real) line.
2. The equator is the (longest / shortest) latitude.
3. The latitudes form (full circles/ semi-circles) on the globe.
4. These are 180 (longitudes / latitudes) in all.
5. The (grid/ compass) helps us to locate places on the earth.

E. Answer the following questions.

1. What is a globe? How is it useful to us?
2. Differentiate between latitudes and longitudes.
3. Which are the main latitudes?
4. What is the importance of the Prime Meridian?
5. What happens when a person crosses the International Date Line?

ACTIVITIES AND PROJECTS

TASKS FOR FA

1. JUST FOR FUN

The earth has been divided into 24 time zones. Every country has one or two time zones. There is one country which is so big that it has 11 time zones. Can you name the country?

Hints:

- It was the first country to launch a space shuttle in space.
- The first man to go into space belonged to this country.
- The first woman to go into space also belonged to this country.

Write your answer here:



Yuri Gargarin

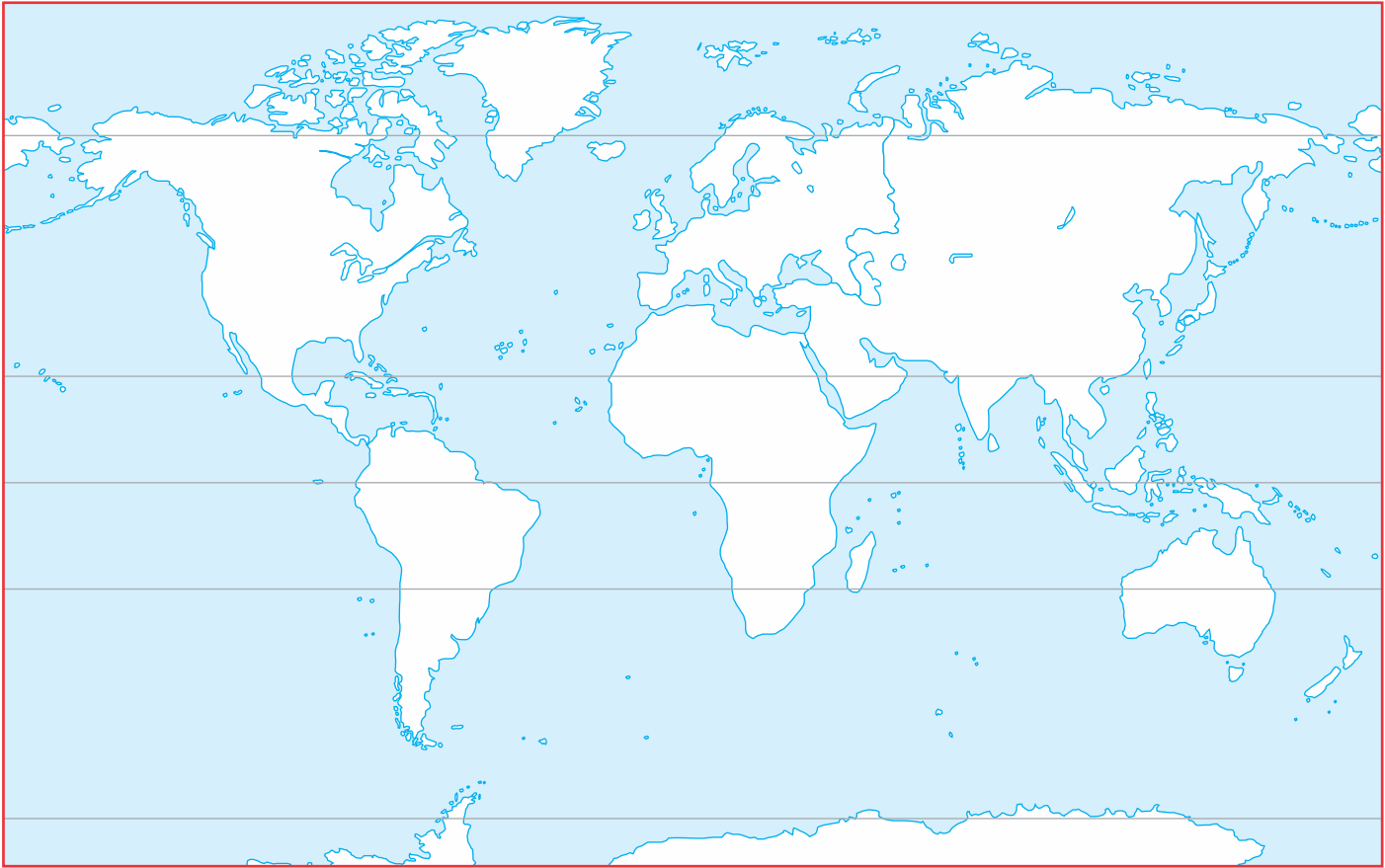
2. Make a model of a globe using a rubber ball, and mark the Equator, North Pole, South Pole, Arctic Circle, Antarctic Circle and Tropics of Cancer and Capricorn.
3. Find out the longitudes and latitudes of the following cities in India :

Delhi Mumbai Chennai Kolkata Bengaluru Srinagar Shimla



MAP ACTIVITY

Colour three continents which lie in the Northern Hemisphere.



SPEAKING SKILLS

Imagine that you are going to a voyage around the earth. How would you prepare for your voyage? Tell the class.

LIFE SKILLS

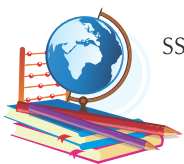
Sea warriors killed Magellan and his men when they were on their historic voyage. People who wanted to do something good for mankind always face problems. But they do not give up. What would you do if you face such problems in your life?

- Would you give up your mission?
- You would move forward?

H.O.T.S.

(High Order Thinking Skills)

1. Through which States of India does the Tropic of Cancer pass?
2. Why is India called a 'tropical country'?



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