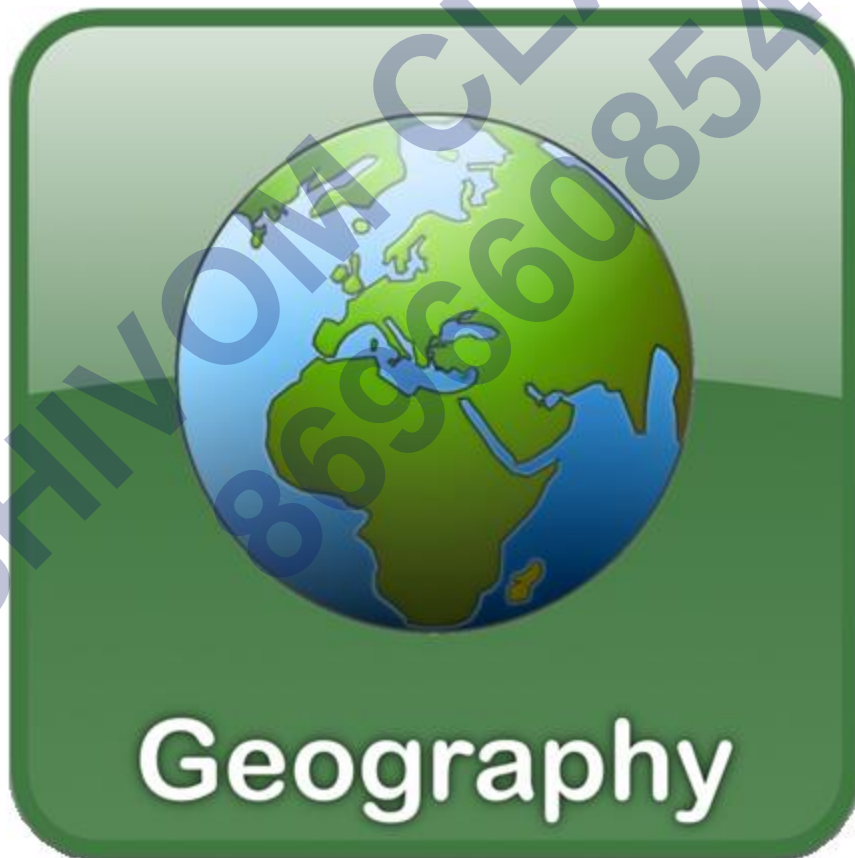


GEOGRAPHY

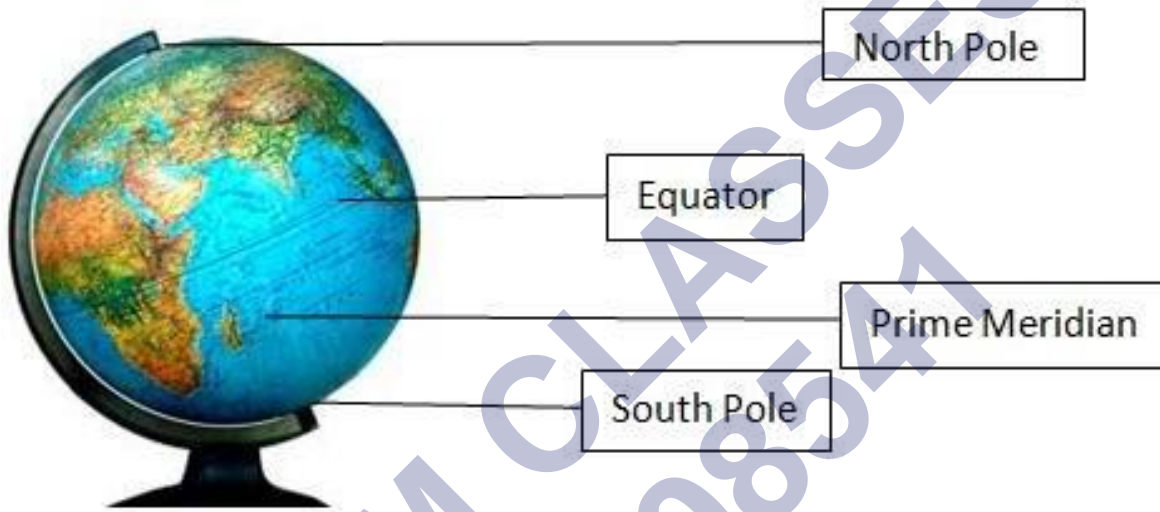
Chapter 2: Globe: Latitudes and Longitudes



Globe: Latitudes and Longitudes

The Globe

A globe is a 3D miniature model of the Earth on which all countries, continents and oceans are shown in a correct proportionate size. Globes are of various sizes.



A needle, fixed into the globe in a tilted manner, is known as its **axis**. The uppermost point of the globe represents the North Pole and the bottom end is known as the South Pole. There are many horizontal lines on the globe which are known as latitudes and vertical lines are known as longitudes. The globe is divided into two equal halves by a latitude, which is known as the **Equator**. The Equator is the 0° latitude. Similarly, the longitude at 0° is known as **Prime Meridian**.

Important Parallels of Latitudes

- The Equator is an imaginary circular line (latitude) which divides the Earth into two equal halves. The northern part of the Earth is known as the **Northern Hemisphere** and the southern part is known as the **Southern Hemisphere**.
- Latitudes are circular and all parallel circles from the Equator up to the poles are known as parallels of latitudes. The parallels of latitudes are measured in degrees.
- The 90° north latitude represents the North Pole and the 90° south latitude marks the South Pole.
- All parallels to the north of the Equator are called north latitudes and all parallels to the

south of the Equator are called south latitudes.

- The **Tropic of Cancer** at 23°N lies in the Northern Hemisphere.
- The Tropic of Capricorn at 23°S lies in the Southern Hemisphere.
- The Arctic Circle at 66°N lies to the north of the Equator.
- The Antarctic Circle at 66°S lies to the south of the Equator.



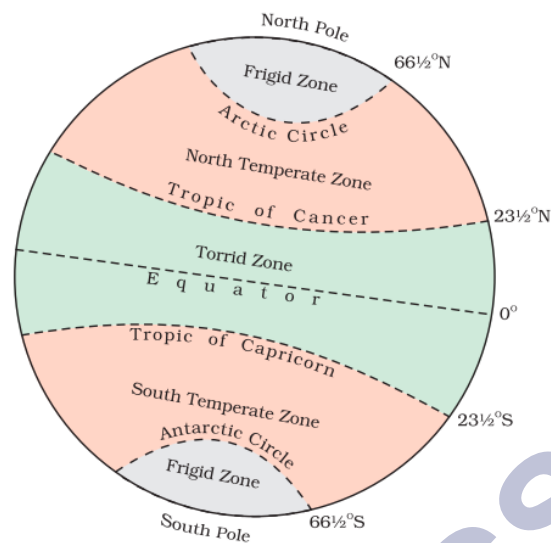
Heat Zones of the Earth

The various heat zones of the Earth are:

Torrid Zone: The Sun is directly overhead at least once during the year on all latitudes lying between the Tropic of Cancer and the Tropic of Capricorn. As a result, this area receives maximum heat from the Sun. **Temperate Zones:** The latitudes lying between the Tropic of Cancer and Arctic Circle in the Northern Hemisphere and the areas between the Tropic of Capricorn and

Antarctic Circle in the Southern Hemisphere lie in the Temperate zone. Here the Sun does not shine directly overhead the latitudes. The regions lying in this zone experience a moderate climate.

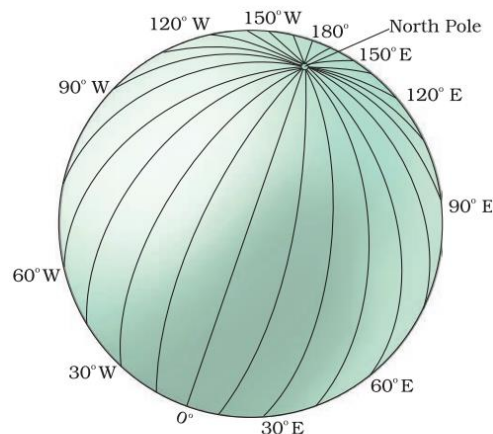
Frigid Zone: The Sun's rays go on decreasing towards the pole. In the areas between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere. The Sun does not rise much above the horizon at the poles and therefore, the regions lying in this zone experience an extremely cold climate.



Important Latitudes and Heat Zones

Meridians of Longitude

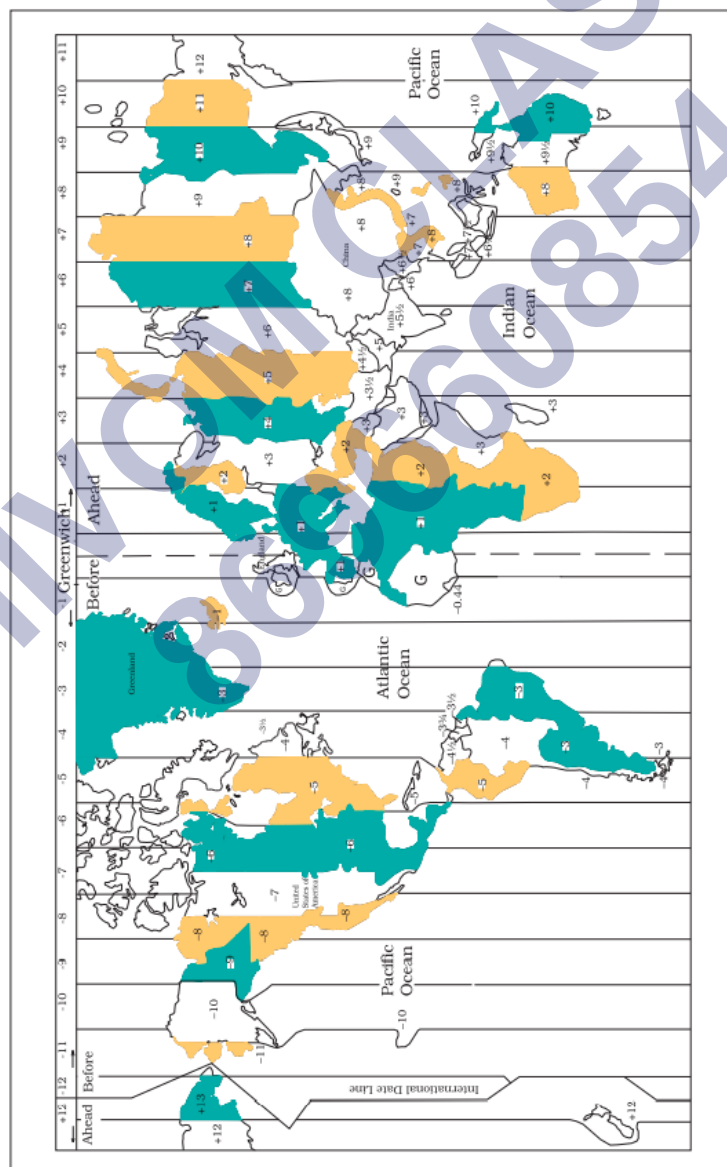
- It is not possible to find out the exact location of a place only on the basis of latitudes. We also have to take into account the longitudes.
- The vertical lines which run from the North Pole to the South Pole are called longitudes or meridians of longitudes.
- The distance between two longitudes is measured in terms of degrees. Longitudes are semi-circular and distance between them decreases as they go towards the poles.
- The **Prime Meridian** is a 0° longitude which passes through the British Royal Observatory at London. It divides the Earth into the Western Hemisphere and the Eastern Hemisphere.
- When the latitudes and the longitudes crisscross each other at right angles, they form a geographical grid or coordinate, which help us to determine the exact location of a place.



The distance between all the longitudes becomes zero at the Poles

Time and Longitude

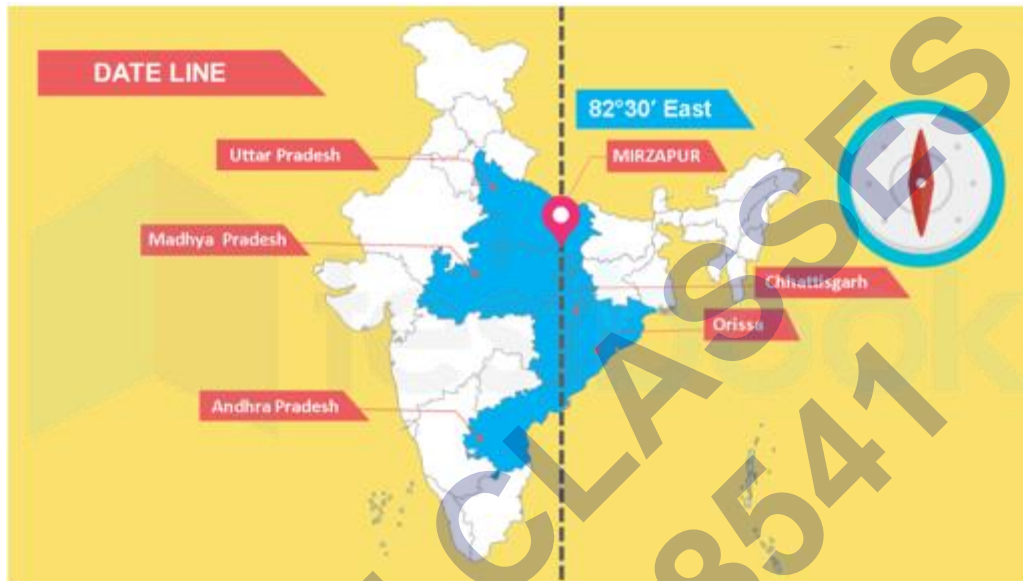
- As the Earth completes one rotation from the west to the east in 24 hours, every meridian receives the direct sunlight of the Sun once every day.
- When the Greenwich meridian receives direct sunlight, the places located along this meridian experience mid-day. As the Earth rotates from the west to the east, the places which are located to the east of Greenwich are ahead of Greenwich Time.
- In the same way, the places located to the west of Greenwich are behind the Greenwich Time.
- The Earth has been divided into twenty-four time zones of one hour each. Each zone thus covers a 15° of longitude.



Time zones of the World

Indian Standard Time

The local time of a place depends on the longitude which passes through it. Many longitudes pass through India. Therefore, the standard time for each country is usually taken as the time of the central meridian which passes through it. In India, the $82\frac{1}{2}^{\circ}\text{E}$ longitude determines the standard time. This is known as the **Indian Standard Time**. This longitude passes through Allahabad in Uttar Pradesh.



Calculating Time

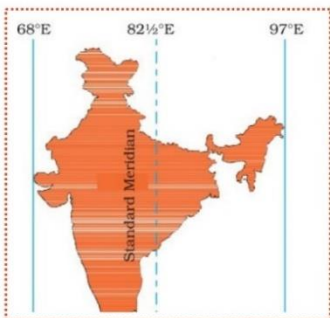
We can calculate the time of two different places with the help of their longitudes.

Lucknow is located at 82°E and London is located at 0 degree GMT. If it is 12 pm in London, we can calculate the local time in Lucknow.

As the Earth rotates from the west to the east, those places which lie to the east of Greenwich are ahead than those places which lie to the west of Greenwich. The Earth rotates 1° in four minutes. Thus if Lucknow is located to the east of Greenwich at 82°E , we will multiply 82 by 4 which will be 328 minutes or 5 hrs and 28 minutes. Therefore, the time in Lucknow is 5 hrs and 28 minutes ahead of London (since Lucknow is located to the east of Greenwich). So if the time in London is 12:00 pm, we will add 5 hrs and 28 minutes to it which will be 5:28 pm.

Therefore, it will be 5:28 pm in Lucknow when it is 12:00 pm in London.

Class : 6th Social Studies (Political Science)
Chapter - 2 : Globe: Latitudes and Longitudes



Equator
- Imaginary line dividing globe into two equal parts.
- Parallels of latitudes

Globe
- A true model of the earth

Axis
Needle fixed through the globe in a tilted manner.

- Time differs on different meridians.
- 82 1/2° E (82° 30 E) is standard meridian of India.
- Standard time for whole country is known as Indian Standard Time.

What do we have Standard time?

Introduction

Important Parallels Of latitudes
- Tropic of Cancer
- Tropic of Capricorn
- Arctic Circle
- Antarctic Circle

Globe: Latitudes and Longitudes

Legitiudes and time

What are longitudes ?

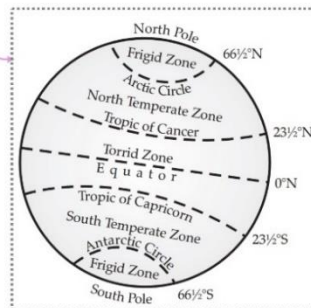
Measured by the movement of the earth, and moon and the planets. Prime meridian of Greenwich

Heat Zones of the Earth

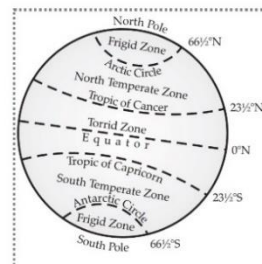
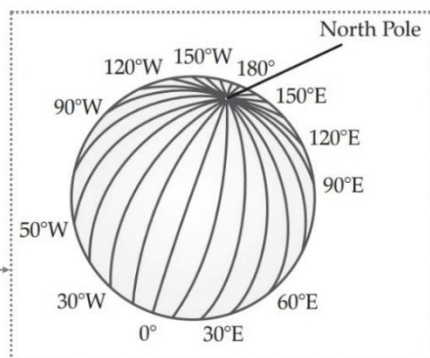
Torrid Zone
Moderate temperature

Fight Zone
Very Cold

Temperate Zone
Moderate temperature



The lines needed to fix the position of a place along with latitude.



Important Questions

➤ Multiple Choice Questions:

Question 1. Parallel of latitude of $66\frac{1}{2}^{\circ}$ north is known as:

- (a) Arctic circle
- (b) Antarctic circle
- (c) Longitude

Question 2. Movement of a heavenly body on its axis is called:

- (a) Rotation
- (b) Longitude
- (c) Axis movement

Question 3. The number of parallels of latitude are:

- (a) 80
- (b) 180
- (c) 360
- (d) 120

Question 4. The number of meridians of latitude are:

- (a) 90
- (b) 180
- (c) 360
- (d) 160

Question 5. What divides the earth into the eastern and western hemisphere?

- (a) prime meridian
- (b) north pole
- (c) Equator

Question 6. The globe is true model of the:

- (a) Universe
- (b) Earth
- (c) Solar system

Question 7. A globe doesn't show the:

- (a) Countries
- (b) Continents
- (c) Trees

Question 8. The number of time zone in Russia are:

- (a) 5
- (b) 2
- (c) 1

Question 9. The equator lies at the _____ degree latitude

- (a) 2
- (b) 1
- (c) 0

Question 10. The northern most end of the axis is the:

- (a) South Pole
- (b) North Pole
- (c) Tropic of Cancer

Question 11. The Arctic Circle is located in the

- (a) Western hemisphere
- (b) Southern hemisphere
- (c) Northern hemisphere
- (d) Eastern hemisphere

Question 12. Describe the shape of the Earth?

- (a) A sphere which bulges at the poles and flattens at the centre
- (b) A sphere which flattens at the poles and bulges at the centre
- (c) A sphere which bulges at the poles and at the centre
- (d) A perfect sphere

Question 13. What are latitude and longitude lines?

- (a) Thick and thin line that divide the Earth
- (b) An imaginary line that divide the Earth
- (c) A real line that divides the Earth
- (d) Long and short line that divide the Earth

Question 14. The Prime Meridian passes through

- (a) Greenwood
- (b) Greenfield
- (c) Greenwhich
- (d) Greenwich

Question 15. What are meridian of longitude?

- (a) The lines running from north pole to the south poles
- (b) The lines running from north pole to the east poles
- (c) The lines running from north pole to the west poles
- (d) The lines running from east pole to the south poles

➤ **Fill in the blanks:**

1. The Frigid Zone lies near the _____.
2. The Antarctic Circle is located in the _____.
3. The _____ of India is $82\frac{1}{2}$ degree east.
4. The 0° Meridian is also known as _____.
5. The southern half is known as the _____ Hemisphere.

➤ **Write true (T) or false (F):**

1. Tropic of Capricorn in the Southern Hemisphere.
2. The distance between the longitudes decreases towards the poles.
3. The Arctic Circle is located in the southern hemisphere.
4. The northern half of the earth is known as the Southern Hemisphere.
5. 90 degrees north latitude marks the North Pole and 90 degrees south latitude marks the South Pole.

➤ **Very Short Questions:**

1. Greenwich line passes through _____.
2. Why the mid-day sun never shines overhead on any latitude beyond the Tropic of Cancer and the Tropic of Capricorn?
3. If it is 12 P.M. at Greenwich, then what will be the time at 15°W ?
4. What are the total number of longitudes?
5. Torrid Zone lies between 00 to $23\frac{1}{2}^\circ$ North and South of equator. True/False
6. State the location of South Pole.
7. The 24 time zones of the Earth are of _____ each.

8. India lies between $8^{\circ}4'$ N and $37^{\circ}6'$ N latitudes. True/False
9. What is the time difference between the eastern most and western most parts of India if standard meridian is not adopted?
- 10.State the location of Antarctic Circle.
- 11.What is the value of South Pole?
- 12.Where does North Temperate Zone lie?
- 13.The angle of the sun rays, as it moves towards the poles increases/Decreases.
- 14.Why is globe important?
- 15.How can we find latitude of a place with the help of a pole star?

➤ Short Questions:

1. Why is Frigid Zone very cold?
2. What are Latitudes & longitudes?
3. What is the difference between the local time and standard time of a place?
4. Why is it necessary to have standard time?
5. How have 90 latitude been calculated in each hemisphere?

➤ Long Questions:

1. Why is it necessary to have standard time? Also define Indian Standard Time (IST).
2. Which meridian is taken as a standard meridian for India and why?
3. What are the advantages of a Globe?
4. How we can calculate time using longitudes?
5. Why is latitude and longitude useful?

ANSWER KEY –

➤ Multiple Choice Answer:

1. Answer: (a) Arctic circle
2. Answer: (a) Rotation
3. Answer: (b) 180
4. Answer: (c) 360
5. Answer: (a) prime meridian
6. Answer: (b) Earth
7. Answer: (c) Trees
8. Answer: (a) 5
9. Answer: (c) 0
10. Answer: (b) North Pole

11. Answer: (c) Northern hemisphere
12. Answer: (b) A sphere which flattens at the poles and bulges at the centre
13. Answer: (b) An imaginary line that divide the Earth
14. Answer: (d) Greenwich
15. Answer: (a) The lines running from north pole to the south poles

➤ **Fill in the blanks:**

1. Poles.
2. southern hemisphere.
3. Standard Meridian
4. Prime Meridian
5. Southern

➤ **Write true (T) or false (F):**

1. True
2. True
3. False
4. False
5. True

➤ **Very Short Answer:**

1. England.
2. The angle of the sun rays keep decreasing.
3. 11 A.M.
4. 360.
5. True.
6. South Pole is in southern hemisphere at 90°S.
7. 1 hour.
8. True.
9. 1 hour 45 minutes.
10. Antarctic Circle lies south of equator at 66½°S.
11. 90°S.
12. 23½°N – 66½°N.
13. Decreases
14. A globe is useful when we want to study the earth as a whole as we can see
 - (i) The water bodies,
 - (ii) The axis,

(iii) The tilt and the location of the countries on the globe.

15. By measuring the angle of the pole star, one can find out the latitude of a place.

➤ Short Answer:

1. It lies close to poles. In this zone the sun does not rise much above horizon. Its rays are always slanting and provide less heat. That is why this zone is very cold.
2. Parallels of latitudes: All parallel circles from the equator up to the poles are called parallels of latitudes.

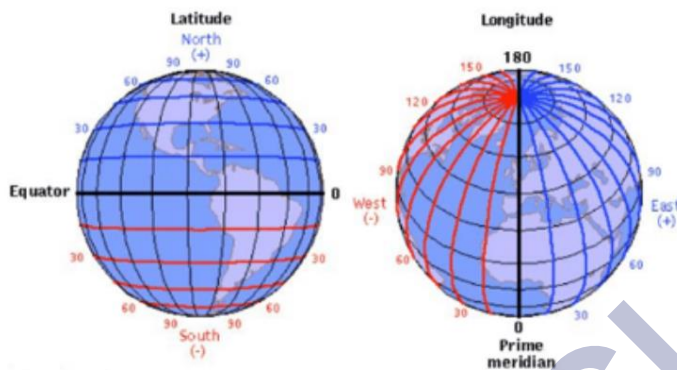


Fig: Latitudes & longitudes

Longitude is the invisible vertical line that runs around the Earth from North to South. The Prime Meridian is where its coordinates are 0° .

3. **Local Time:** Local time is the real time of a place according to its corresponding longitudes. Every place has its unique local time. Places having the same meridian of longitude have the same local time.

Standard Time: Standard time of a place is the time of that time zone in which that place lies. In countries with large east west extent variations in local time present; to overcome this problem standard time of specific time zone is taken as standard time of that place.

4. Standard time is necessary because:
 - The different meridian's having different time is likely to create problems for trains & flights.
 - To maintain uniformity in the country and the world.
5. The equator represents the zero degree latitude. Since the distance from the equator to either of the poles is one-fourth of a circle round the earth, it will measure $1/4$ th of 360 degrees, i.e., 90° .

➤ Long Answer:

1. It is necessary to have a standard time because:
 - Different meridians have different time, which makes it difficult to prepare a

time table for trains and flights.

- It helps to maintain uniformity of time in the country and the world.

Indian Standard Time: In India, the longitude of $82^{\circ} 30' E$ is treated as the standard meridian and the local time at this meridian is taken as the standard time for the whole country. It is known as Indian Standard Time (IST).

2. This is because India is a vast country and has a great difference in sunrise timing along West in Gujarat and East in Arunachal Pradesh. There is a time difference of 1 hour and 45 minutes. Hence, it is necessary to have a specific time all over the India which is done by taking Standard Meridian of India at 82.30° East at the Tropic of Cancer passing through the middle of India. To avoid such confusion and to have same time all over the country, we have taken a standard meridian.

3. **Advantages of the Globe are:**

- It shows the exact shape of the Earth
- It helps us to understand how day and night occur and seasons are caused.
- It gives the ideas of tilt of the Earth's axis.
- It shows us the exact position and areas of the continents and the oceans.

4.



- In the figure, three places namely a, b and c are marked.
- Let us assume that time difference between 'a' 'b' and 'c' is 1 hour each.
- If the time at a place 'b' is 6 in the morning
- then the time at 'a' would be 5 in the morning
- time at 'c' would be 7 in the morning.
- The time at place 'a' is 1 hour less because it is to the west of 'b'
- and time at 'c' is 1 hour more because it is to the east of 'b'.
- It is because Earth rotates from west to east.
- As the sun rises in the east so place 'c' has 7 am,
- place 'b' has 6 am and
- place 'a' has 5 am.
- This shows that time increases as we go towards east and it decreases as we go to

west.

5. Usefulness of Longitude and Latitude:

- The Earth is divided into degrees of longitude and latitude which helps us measure location and time using a single standard.
- When used together, longitude and latitude define a specific location through geographical coordinates. These coordinates are what the Global Position System or GPS uses to provide an accurate locational relay.
- Longitude and latitude lines measure the distance from the Earth's Equator or central axis – running east to west – and the Prime Meridian in Greenwich, England – running north to south.
- They have been useful to navigators, geographers, cartographers and surveyors for a long time. Latitude and longitude are useful on a daily basis for a great number of people for global positioning system, GPS and computerized mapping.
- Using latitude and longitude, it is possible to calculate all sorts of things such as calculate the distances from city to city, calculate the distance from any point on earth to any other point.

Example: we can calculate the distance from your house to school.