

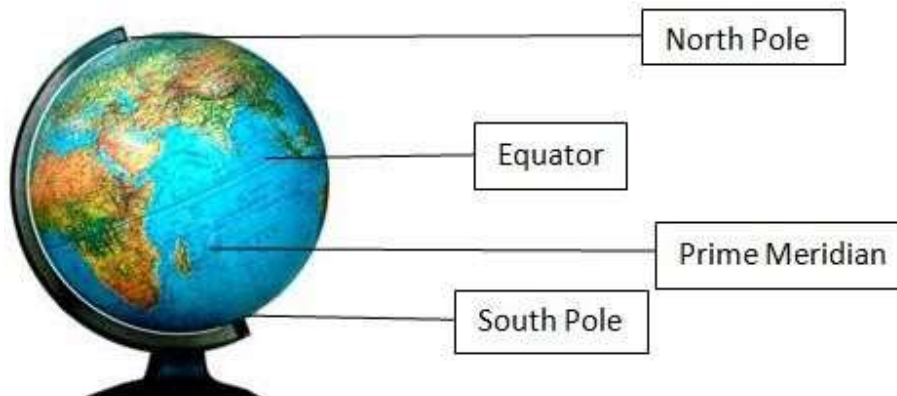
**GEOGRAPHY**

## Globe: Latitudes and Longitudes

### The Globe

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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  $0^\circ$  latitude. Similarly, the longitude at  $0^\circ$  is known as **Prime Meridian**.

### Important Parallels of Latitudes

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- 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  $90^\circ$  north latitude represents the North Pole and the  $90^\circ$  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  $23^\circ\text{N}$  lies in the Northern Hemisphere.
- The Tropic of Capricorn at  $23^\circ\text{S}$  lies in the Southern Hemisphere.
- The Arctic Circle at  $66^\circ\text{N}$  lies to the north of the Equator.
- The Antarctic Circle at  $66^\circ\text{S}$  lies to the south of the Equator.

### Heat Zones of the Earth

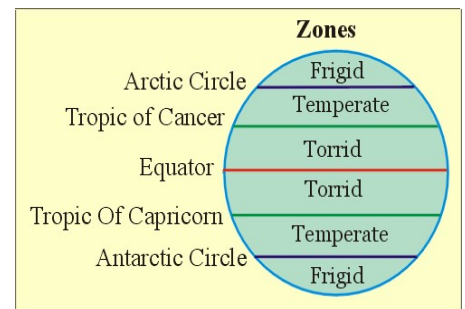
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The various heat zones of the Earth are:

**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.

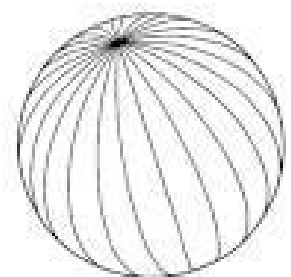
**Frigid Zone:** The Sun's rays go on decreasing towards the pole. In the areas between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere. The Sun does not rise much above the horizon at the poles and therefore, the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



The heat zones of the Earth

## 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  $0^\circ$  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  $15^\circ$  of longitude.

## 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  $82^{\circ}\text{E}$  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  $1^{\circ}$  in four minute. Thus if Lucknow is located to the east of Greenwich at  $82^{\circ}\text{E}$ , 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.