



Rabindranath World School
W-10/3120, DLF Phase III, Gurgaon (HR).

CHAPTER 2 **GLOBE: LAITUDES AND LONGITUDES**

NOTES:

Globes are of various sizes and types such as big ones, small pocket globes, and globe-like balloons. The globe is not fixed and can be rotated the same way as a top spin or a potter's wheel is rotated. On the globe, countries, continents and oceans are shown in their correct size

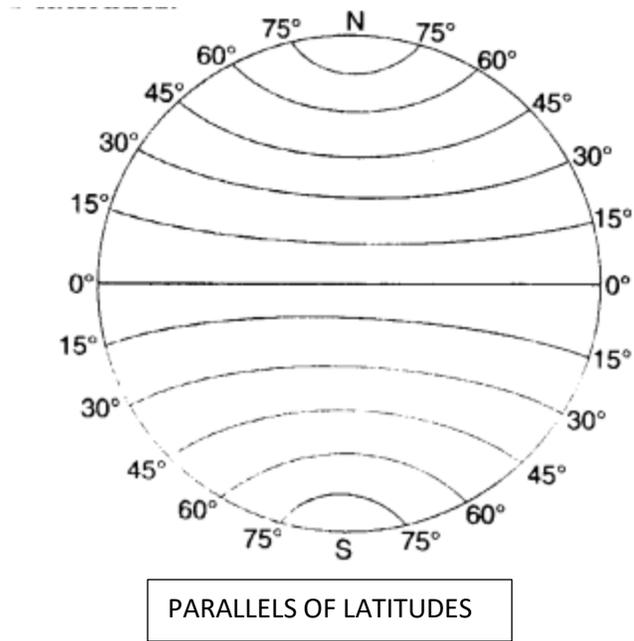


A needle is fixed through the globe in a tilted manner, which is called its axis. Two points on the globe through which the needle passes are two poles – North Pole and South Pole.

The globe can be moved around this needle from west to east just as the earth moves. But, there is a major difference. The real earth moves around its axis, which is an imaginary line. Another imaginary line running on the globe divides it into two equal parts. This line is known as the equator. The northern half of the earth is known as the Northern Hemisphere and the southern half is known as the Southern Hemisphere. They are both equal halves.

The equator is an imaginary circular line to locate places on the earth. All parallel circles from the equator up to the poles are called parallels of latitudes. Latitudes are measured in degrees.

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 $\frac{1}{4}$ th of 360 degrees, i.e. 90° . Thus, 90 degrees north latitude marks the North Pole and 90 degrees south latitude marks the South Pole.

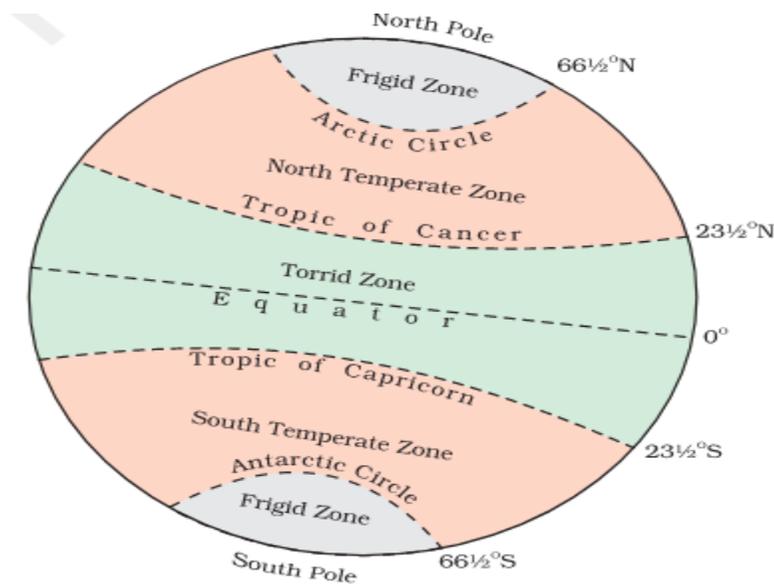


All parallels north of the equator are called ‘north latitudes.’ Similarly all parallels south of the equator are called ‘south latitudes.’ The value of each latitude is, indicated by the letter ‘N’ or ‘S’.

IMPORTANT PARALLELS OF LATITUDE

There are four important parallels of latitudes

1. Tropic of Cancer ($23\frac{1}{2}^{\circ}$ N) in the Northern Hemisphere.
2. Tropic of Capricorn ($23\frac{1}{2}^{\circ}$ S) in the Southern Hemisphere.
3. Arctic Circle at $66\frac{1}{2}^{\circ}$ north of the equator.
4. Antarctic Circle at $66\frac{1}{2}^{\circ}$ south of the equator.



HEAT ZONES OF THE EARTH

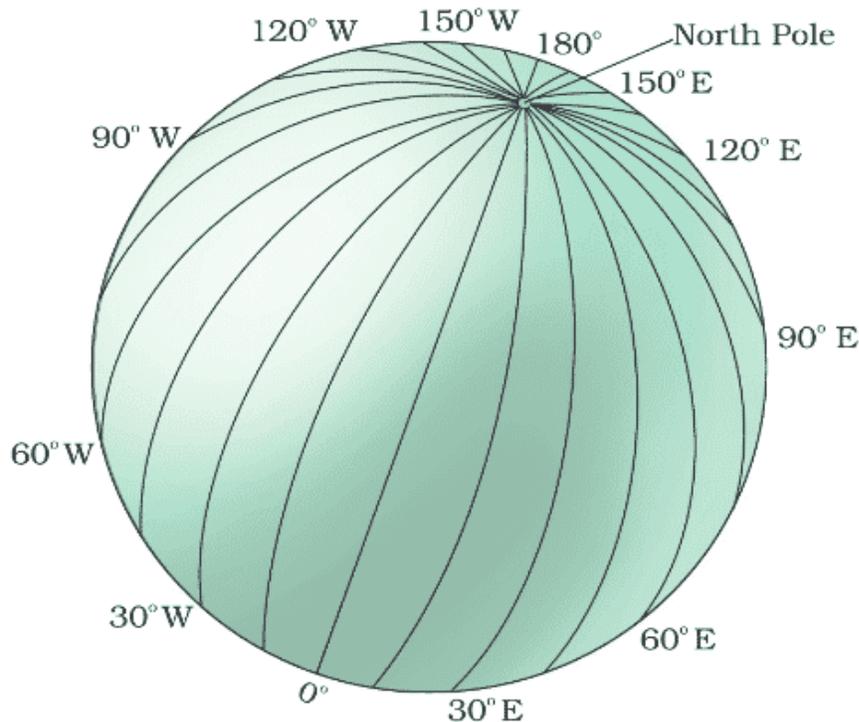
Torrid Zones – The mid-day sun is exactly overhead at least once a year on all latitudes in between the Tropic of Cancer and the Tropic of Capricorn. This area, therefore, receives the maximum heat and is called the Torrid Zone.

Temperate Zones – The mid-day sun never shines overhead on any latitude beyond the Tropic of Cancer and the Tropic of Capricorn. The angle of the sun's rays goes on decreasing towards the poles. As such, the areas bounded by the Tropic of Cancer and the Arctic Circle in the Northern Hemisphere, and the Tropic of Capricorn and the Antarctic Circle in the Southern Hemisphere, have moderate temperatures. These are called Temperate Zones.

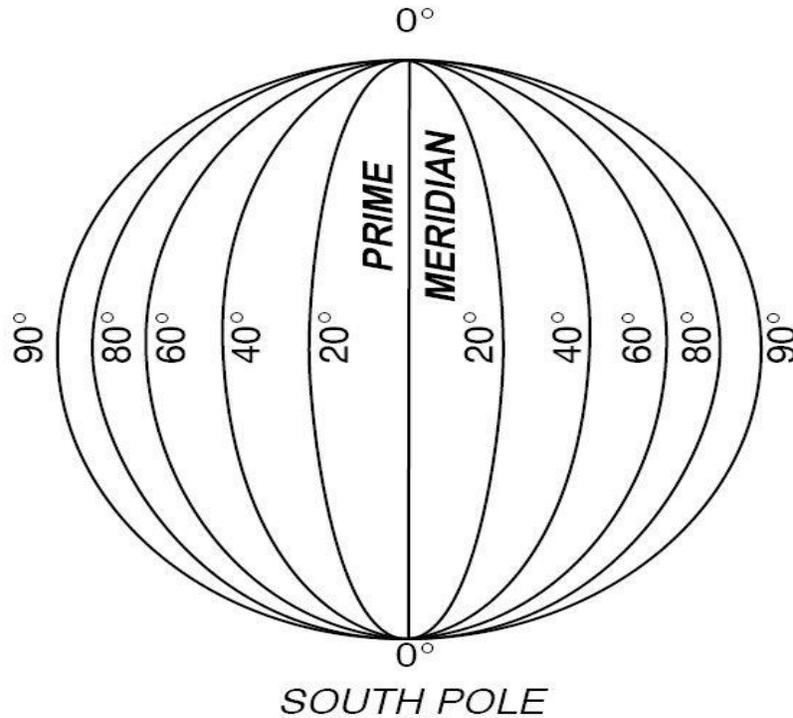
Frigid Zones – Areas lying between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere are very cold. It is because here the sun does not rise much above the horizon. Therefore, its rays are always slanting and provide less heat. These are called Frigid Zones.

WHAT ARE LONGITUDES?

Meridians of longitude are drawn from the North Pole to the South Pole and are at right angles to the Equator. The distances between meridians of longitude are measured in degrees of longitude. Each degree is further divided into minutes, and minutes into seconds.



Prime Meridian is an imaginary line on Earth that passes north to south through the Greenwich Observatory in London, England. The prime meridian divides Earth into the Eastern Hemisphere and the Western Hemisphere. The prime meridian is at 0° (0 degrees) longitude. The longitude of a place is followed by the letter E for the east and W for the west.



LONGITUDE AND TIME

The best means of measuring time is by the movement of the earth, the moon and the planets. When the Prime Meridian of Greenwich has the sun at the highest point in the sky, all the places along this meridian will have mid-day or noon. As the earth rotates from west to east, those places east of Greenwich will be ahead of Greenwich time and those to the west will be behind it.

The rate of difference can be calculated as follows. The earth rotates 360° in about 24 hours, which means 15° an hour or 1° in four minutes. Thus, when it is 12 noon at Greenwich, the time at 15° east of Greenwich will be $15 \times 4 = 60$ minutes, i.e., 1 hour ahead of Greenwich Time, which means 1 p.m. But at 15° west of Greenwich, the time will be behind Greenwich time by one hour, i.e., it will be 11.00 a.m. Similarly, at 180° , it will be midnight when it is 12 noon at Greenwich.

WHY DO WE HAVE STANDARD TIME?

The local time of places, which are on different meridians are bound to differ. In India, for instance, there will be a difference of about 1 hour and 45 minutes in the local times of Dwarka in Gujarat and Dibrugarh in Assam. It is, therefore, necessary to adopt the local time of some central meridian of a country as the standard time for the country. In India, the longitude of $82\frac{1}{2}^\circ$ E ($82^\circ 30'E$) is treated as the standard meridian. The local time at this meridian is taken as the standard time for the whole country. It is known as the Indian Standard Time (IST).