GLOBE: LATITUDES AND LONGITUDES

GLOBES

You have read that our planet earth is not a sphere. It is slightly flattened at the North and the South Poles and bulge in the middle. Can you imagine how it looks? You may look at a globe carefully in your classroom to get an idea. Globe is a true model (miniature form) of the earth.

Globes may be of varying size and type – big ones, which cannot be carried easily, small pocket globes, and globe-like balloons, which can be inflated and are handy and carried with ease. The globe is not fixed. It 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.

It is difficult to describe the location of a point on a sphere like the earth. Now the question arises as to how to locate a place on it? We need certain points of reference and lines to find out the location of places.

Globe

PARALLELS OF LATITUDE AND MERIDIANS OF LONGITUDE

If you look at the globe or at the world map you will notice two sets of lines drawn on them. One set of these lines run horizontally or in the east-west direction while the other set of lines run vertically or in the north-south direction .They cut each other like the lines on a graph-paper. The horizontal or east-west set of lines on the globe (or on the world map) are called Parallels of Latitude while the vertical or north-south lines are called Meridians of Longitude. Remember, both longitudes and latitudes are imaginary lines drawn on the globe or the world map. There are no such lines on the surface of the earth. In drawing these imaginary lines, we use the North Pole and the South Pole as two basic points of reference on the surface of the earth. These two sets of lines crisscross in such a way that they make a virtual network on the face of the globe.

Latitudes are drawn in the east-west direction between the two poles.They run parallel to the equator. The Equator is an imaginary line dividing the earth into two hemispheres the Northern Hemisphere and the Southern Hemisphere. As these lines are drawn parallel to the equator, so they are called Parallels of Latitude. Teh distance between these lines is always the same.

Latitude is defined 'as the angular distance, north or south of the equator'. the latitude of the equator is supposed to be 0° while that of the North Pole is 90°N and that of the South Pole is 90°S. The parallels of latitude to the north of the equator are known as north latitudes and those to the south of the equator are known as south latitudes. There are 90 lines to the north of the equator and 90 lines to the south of the equator. Thus, in all, there are 181 parallels of latitude.

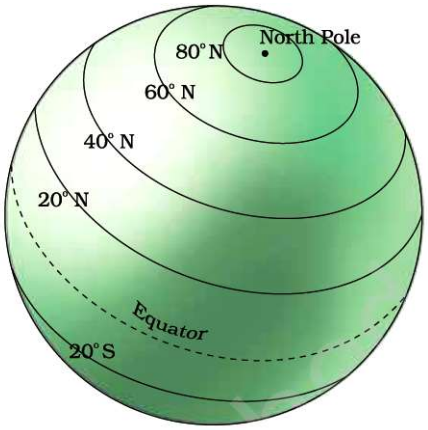
The angular distance from the equator is measured in degrees; each degree is further dividedi nto minutes and each mintue into seconds.

◈ IMPORTANT PARALLELS OF LATITUDES

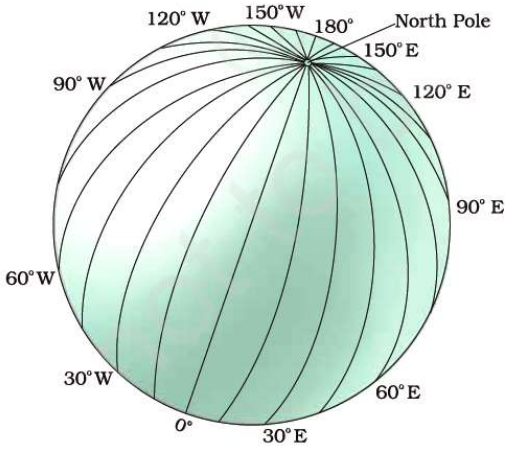
Besides the equator (0°), the North Pole (90°N) and the South Pole (90° S), there are four important parallels of latitudes– (i) Tropic of Cancer (23° N) in the Northern Hemisphere. (ii) Tropic of Capricorn (23° S) in the Southern Hemisphere. (iii) Arctic Circle at 66° north of the equator. (iv) Antarctic Circle at 66° south of the equator.

◈ IMPORTANCE OF THE LATITUDES

Latitudes have an importance of its own. By means of latitudes we can very easily form an idea of the temperature of a place. Consequently, with the help of latitudes we can divide the earth into Heat Zones. With the help of latitudes we can find out the distance of a palce from the equator. (One degree of latitude is roughly equal to 111 km.) Alongwith longitudes, latitudes help us to find out the exact location of a place.



Latitudes



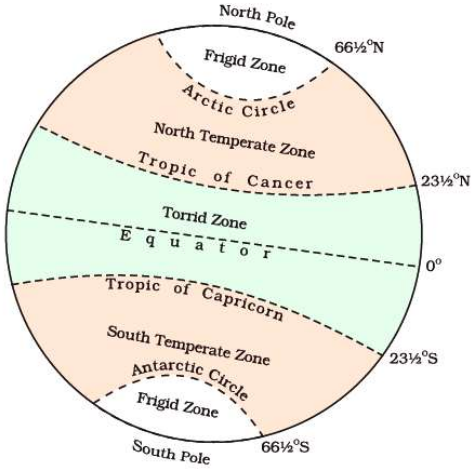
Longitude

HEAT ZONES OF THE WORLD

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.

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, therefore, called Temperate 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, therefore, called Frigid Zones (very cold).



Important Latitudes and Heat Zones

WHAT ARE LONGITUDES?

To fix the position of a place, it is necessary to know something more than the latitude of that place. You can see, for example, that Tonga Islands (in the Pacific Ocean) and Mauritius Islands (in the Indian Ocean) are situated on the same latitude (i.e., 20° S). Now, in order to locate them precisely, we must find out how far east or west these places are from a given line of reference running from the North Pole to the South Pole. These lines of references are called the meridians of longitude, and the distances between them are measured in 'degrees of longitude.' Each degree is further divided into minutes, and minutes into seconds. They are semicircles and the distance between them decreases steadily polewards until it becomes zero at the poles, where all the meridians meet.

Unlike parallels of latitude, all meridians are of equal length. Thus, it was difficult to number the meridians. Hence, all countries decided that the count should begin from the meridian which passed through Greenwich, where the British Royal Observatory is located. This meridian is called the Prime Meridian. Its value is 0° longitude and from it we count 180° eastward as well as 180° westward. The Prime Meridian and 180° meridian divide the earth into two equal halves, the Eastern Hemisphere and the Western Hemisphere. Therefore, the longitude of a place is followed by the letter E for the east and W for the west. It is, however, interesting to note that 180° East and 180° West meridians are on the same line.

DIFFERENCES BETWEEN THE PARALLELS OF LATITUDE AND MERIDIANS OF LONGITUDE

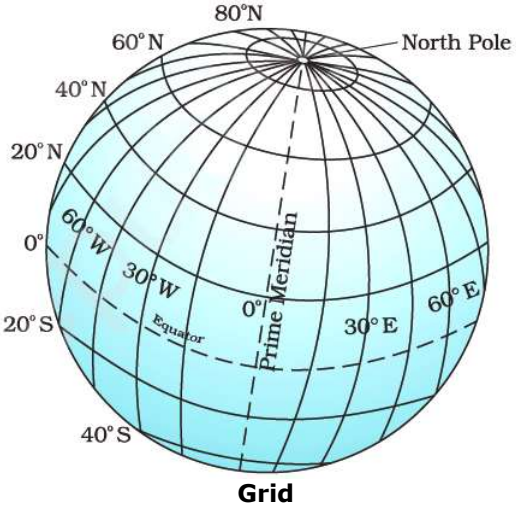
It would be better if we draw a clear line of demarcation between the parallels of latitude and the meridians of longitude. It would facilitate a better understanding of the whole thing.

As discussed above, the parallels of latitude are drawn in between the two poles and are parallel to the equator. The equator is also an imaginary line drawn in the middle of the earth. On the other hand, the meridians of longitude are drawn joining the North Pole and the South Pole.

While the parallels of latitude are drawn in the east-west direciton, the meridians of longitude are drawn in the north-south direciton.

The parallels of latitude are not equal in size. They go on diminishing in size from equator to the poles. On the other hand the meridians of longitude are always equal in size.

While the parallels of latitude are 181 in number, the meridians of longitude are 360 in number.

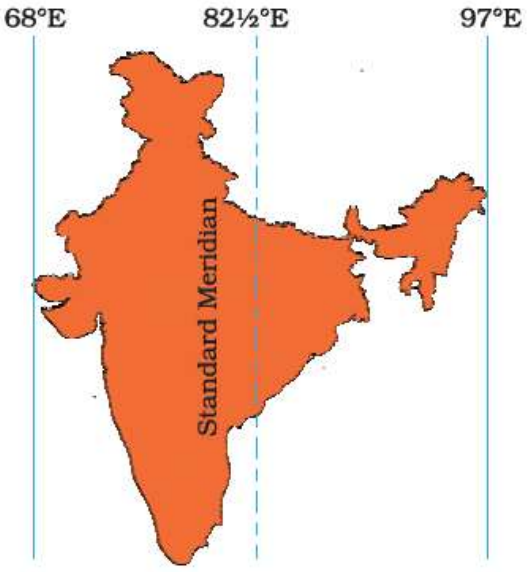


Grid

WHY DO WE HAVE STANDARD TIME?

The local time of places which are on different meridians are bound to differ. For example, it will be difficult to prepare a time-table for trains which cross several longitudes. 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° E (82° 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).

India located east of Greenwich at 82°30'E is 5 hours and 30 minutes ahead of GMT. So it will be 7:30 p.m. in India when it is 2:00 p.m. noon in London. Some countries have a great longitudinal extent and so they have adopted more than one standard time. For example, in Russia, there are as many as eleven standard times. The earth has been divided into twenty-four time zones of one hour each. Each zone thus covers 15° of longitude.



Indian Standard Meridian