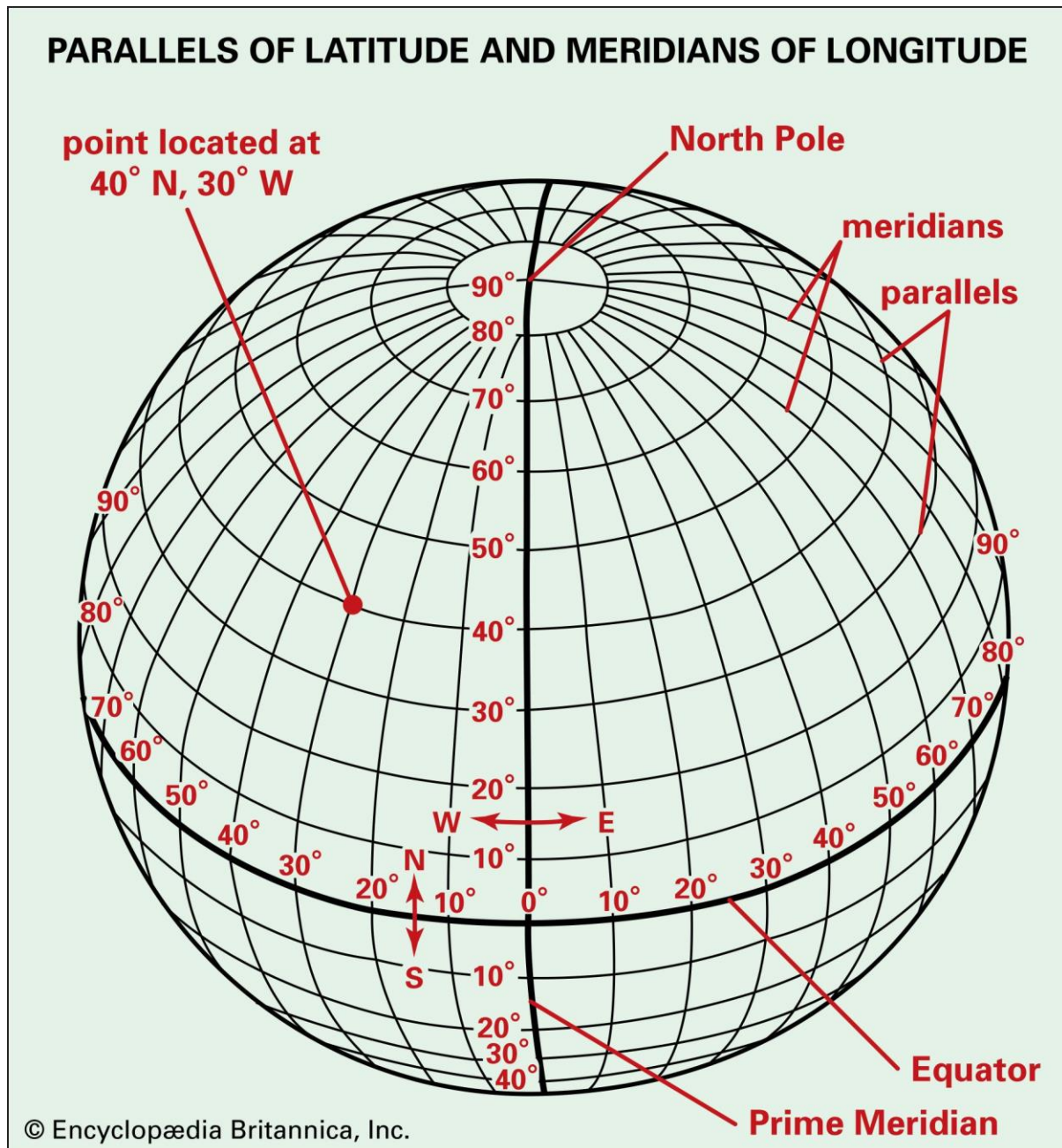


Latitude and Longitude



Latitude and longitude are a system of lines used to describe the location of any place on Earth. Lines of latitude run in an east-west direction across Earth. Lines of longitude run in a north-south direction. Although these are only imaginary lines, they appear on maps and globes as if they actually existed.

Latitude

Lines of latitude (also called parallels) circle Earth parallel to the Equator. The Equator is an imaginary line that lies halfway between the North Pole and the South Pole. It runs east-west all the way around Earth. Lines of latitude describe positions north and south of the Equator.

Lines of latitude are measured in degrees ($^{\circ}$). Degrees may be broken down into smaller units called minutes ($'$) and seconds ($''$). The Equator is 0° . The North Pole is 90° north (N), and the South Pole is 90° south (S). Lines of latitude north of the Equator are numbered from 1° to 89° N. Lines of latitude south of the Equator are numbered from 1° to 89° S.

There are other important lines of latitude besides the Equator. For example, the Arctic Circle ($66^{\circ} 30' \text{ N}$) and the Antarctic Circle ($66^{\circ} 30' \text{ S}$) surround the cold regions around the North and South poles. The area between the Tropic of Cancer ($23^{\circ} 27' \text{ N}$) and the Tropic of Capricorn ($23^{\circ} 27' \text{ S}$) is called the tropical zone or the tropics. It is known for its generally hot weather.

Longitude

Lines of longitude run between the North Pole and the South Pole. These lines are also called meridians. Like lines of latitude, meridians are measured in degrees, minutes, and seconds.

The north-south line that marks 0° longitude passes through Greenwich, England. This is called the Greenwich, or prime, meridian. Greenwich was chosen for the prime meridian because when the system of latitude and longitude was established Great Britain was a world leader in exploration and map making. Greenwich was the home of Britain's royal observatory.

Other lines of longitude describe positions east and west of the prime meridian. Lines of longitude east of the prime meridian are numbered from 1° to 179° east (E). Lines of longitude west of the prime meridian are numbered from 1° to 179° west (W). The 180th meridian, or 180° , is the line of longitude exactly opposite the prime meridian.

How the two work together

Latitude and longitude together can describe the exact location of any place on Earth. For example, Washington, D.C., lies 39 degrees north of the Equator and 77 degrees west of the prime meridian. Its position is 39° N , 77° W . These two numbers together are called coordinates.

There are five main parallels that are helpful in explaining the correlation between the Earth, the Sun, and the weather. As such, these five main parallels also mark the five geographic zones. These are:

Arctic Circle: It is the limit of the North Glacial Zone to the north.

Tropic of Cancer: encloses the northern temperate zone with the Arctic Circle.

Equator: divides the earth into northern and southern hemispheres. The area around the Equator is known as the Tropics and is bounded to the north by the Tropic of Cancer and to the south by the Tropic of Capricorn.

Tropic of Capricorn: encloses the southern temperate zone with the Antarctic Circle.

Antarctic Circle: it is the limit of the South Glacial Zone towards the south.

Arctic Circle

This parallel of latitude is currently 66° south of the equator. Like the Arctic, the position of the Antarctic Circles is not fixed, since their exact location depends on the axial tilt of the Earth, which fluctuates within a range of 2° in a period of 40,000 years, mainly due to forces of the tides resulting from the orbit of the Moon.

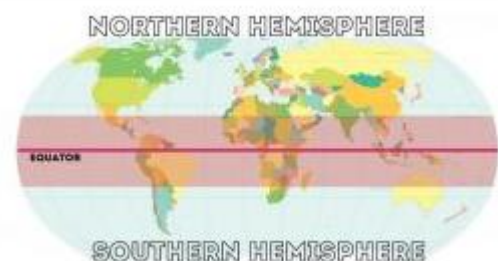
Tropic of Cancer

The Tropic of Cancer is a Circle of Latitude currently located 23° north of the Equator. Another reference for the Tropic of Cancer is the Tropic of the North. The Tropic of the North is the parallel in which the Summer Solstice occurs when once a year the sun appears directly over the northernmost parallel. This event occurs in the month of June.

Tropic of Capricorn

The Tropic of Capricorn is another Circle of Latitude currently located 23° south of the Equator. It is also known as the Tropic of the South. The Tropic of Capricorn is the parallel on which the Winter Solstice occurs when once a year the sun appears directly over the southernmost part of the parallel. This event occurs in the month of December. These two parallels enclose the area of the Earth known as The Tropics, characterized by a temperate to warm climate and exuberant vegetation. Like the Arctic Circle, the tropics of Cancer and Capricorn also vary depending on the tilt of the Earth.

The Equator: Where is the equator located?



The equator is the parallel line located at 0° . It is identified as the latitude that falls at the point that is halfway between the North Pole and the South Pole. The Equator covers a distance on the Earth's surface of approximately 40,000 km long (24,901 miles). The sun is perpendicular to the equator twice a year in March and September. This event is called the equinox. The areas on the Earth's surface that fall on the equator are characterized by almost constant lengths of day and night. Similarly, the equator fluctuates and is identified as the plane that is perpendicular to the axis of rotation of the Earth.

Greenwich Meridian: What is the Prime Meridian?

The Zero Meridian is the meridian defined as 0° of longitude. It is the longitudinal meridian of reference. Unlike the position of the Equator which is determined by the Earth's axis of rotation, the position of the Greenwich Meridian has been arbitrarily defined over the years in Greenwich, UK. The Zero Meridian divides the Earth into two hemispheres, the Western Hemisphere to the west and the Eastern Hemisphere to the east.

