

Class-6th

Geography

Lesson-2

Globe: latitude and longitude

Dear students

As you have studied earlier that in ancient times people thought that the earth was flat in shape, but with later discoveries it came to be known that the earth is spherical in shape. It is not a complete sphere as it is slightly bulging at the centre and is flattened at the poles. Later on a Globe was constructed which proved to be an accurate model of the Earth.

Globe

A globe is the spherical model of the Earth. Globes come in various sizes and types. As we all know that the earth is tilted on its axis the same way the globe to is tilted on its axel. The axis of the earth is tilted at an angle of $23^{1/2}$ degree. Similarly the globe also tilts on its axle at the same angle. In a globe the axle joins the two poles of the globe.

As the Earth is spherical it does not have corners, sides, a top and a bottom. At the end of the axis are the poles. The **North Pole** is at the northern end and the **South Pole** is at the southern end. Hence, it becomes difficult for us to locate places on earth. Therefore we use certain lines and points of reference called latitudes and longitudes.

Latitudes

Latitude is a distance measured in degrees, north and south of the **Equator**. It is measured with 180 imaginary lines which circle around the earth. Lines of latitude circle the globe in an east-west direction parallel to the equator. The distance between them is always the same. They are also known as **Parallels of Latitudes**. Each parallel of latitude is a circle. As the circumference of the earth gets smaller towards the poles, the lines of latitude are shorter towards the poles.

The Equator is at 0 degree latitude and it divides the Earth into two equal parts, the Northern Hemisphere and the Southern Hemisphere. All lines of latitude have lines between 0° and 90° and a direction, north or south of the Equator. The North Pole is at 90° N and the South Pole it at 90° S.

Important Lines of Latitude.

There are four important lines of Latitude.

1. The Tropic of Cancer. ($23^{1/2} \text{ }^\circ \text{ N}$)
2. The Tropic of Capricorn ($23^{2/30} \text{ }^\circ \text{ S}$)
3. Arctic Circle ($66^{1/20} \text{ }^\circ \text{ N}$)
4. Antarctic Circle ($66^{1/20} \text{ }^\circ \text{ S}$)

Climatic Zones of the Earth

The earth is divided into three main Climatic zones- Torrid Zone, Temperate Zone and Frigid Zone.

Torrid Zone

The region between the Tropic of Cancer and the Tropic of Capricorn receive direct rays of the sun almost throughout the year. This area receives maximum heat and is called the Torrid Zone.

Temperate Zone

The regions between 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, are moderately hot. This is because the angle of the Sun's rays decreases as we move towards the pole. These areas have moderate temperatures and are called the Temperate Zones.

Frigid Zone

Near the Polar Regions, the rays of the sun are very slanted and it is very cold. The regions between the Arctic Circle and the North Pole in the Northern Hemisphere, and in the Southern Hemisphere, between the Antarctic Circle and the South Pole are called the Frigid Zones.

Longitudes

Longitudes are the imaginary lines that join the poles in the north south direction. They are also called meridians, and are used to measure how far the east or west the location of a place is. They measure the angular distance of a place on the surface of the Earth. The **Prime Meridian** is the line of longitude, corresponding to 0° and passing through Greenwich, England from which all the other lines of longitude are calculated. On the opposite side of the earth is the 180° meridian, which is the **International Date Line**. All lines of longitudes have numbers between 0° to 180° and a direction, east or west of the prime meridian. The prime meridian divides the Earth into two halves, the **Eastern Hemisphere** and the **Western Hemisphere**. As longitudes join the poles, they are always the same length, but are farthest apart at the Equator and closest together at the poles.

Locating Places

Lines of latitude help us locate places on the Earth, north or south of the Equator. Similarly longitudes help us locate places on the Earth east or west of the Meridian. When the lines of latitude and longitude are drawn on a map they form a **grid**. This pattern of square is used to find places on a map. The latitude is always stated before the longitude, and they intersect each other at right angles. The point where the latitude and longitude of a place intersect gives us the exact location or the geographical **coordinates** of a place. The geographical coordinates are used to tell the exact location of a ship or an aircraft. To be even more accurate in locating a place, each degree of latitude and longitude is further divided into smaller units called **minutes**. There are 60 minutes in each degree.

Longitude and Time

A relationship exists between the lines of longitude and time. In order to maintain uniformity, a standard time, corresponding to the location of the Prime Meridian is adopted by all countries. Every place in the world calculates time based on the **Greenwich Mean Time (GMT)**. Zone times are the Standard Times kept on land and sea compared with 12 hours (noon) GMT. Every 15° east or west of the Greenwich Meridian the time changes by 1 hour. East is ahead and West is behind Greenwich Mean Time. A time zone

is a region throughout which the same standard time is used. There are 24 time zones in the world, demarcated approximately by meridians at 15° intervals, an hour apart.

Local time

All places on the same meridian of longitude have noon at the same time. This is called the local time of that particular place. Places located on different meridians have different local times. The Earth takes 24 hours to complete one rotation that is, it takes 24 hours to complete 360° of its rotation.

In one hour, the Earth rotates 15° Longitude.

If the Earth takes 60 minutes to rotate 15° , then for 1° the Earth will take 4 minutes.

Therefore a difference of 1° longitude creates a time difference of 4 minutes.

International Date Line

The International Date Line (IDL) is an imaginary line of longitude, on the Earth's surface. It is 180° east or west of the Prime Meridian. The IDL separates two calendar days. The date towards the east of the IDL in the eastern hemisphere is one day earlier. As one crosses the IDL towards the west the time zone changes and a day is added.