

# GEOGRAPHY

## Motions of the Earth

### Rotation and Revolution of the Earth

Rotation and revolution are two types of motions of the Earth.

#### Rotation of the Earth

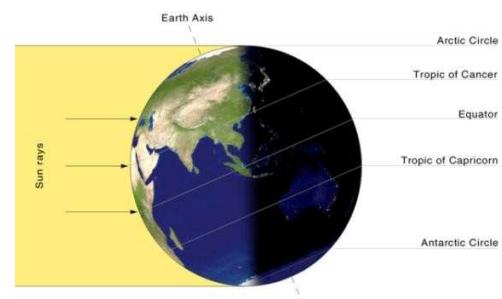
The spinning of the Earth on its axis is called **rotation**. The Earth takes about 24 hours to complete one rotation. This is called the **Earth day**.

The Earth receives light from the Sun. As the Earth is spherical in shape, only half of the Earth gets sunlight at a time. The half of the Earth which faces the Sun experiences day while the other half which is away from the Sun experiences night.

The circle which divides day and night on the globe is called the **circle of illumination**.

If the Earth does not rotate, then

- The part of the Earth facing the Sun would always experience day. This will lead to a constant increase in the temperature.
- The other half of the Earth would always remain in darkness. This will result in a continuous decrease in the temperature.
- In both the conditions, survival of any life form will not be possible.

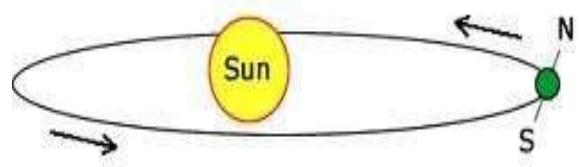


The imaginary line of the circle which divides day and night on the globe is called the **circle of illumination**.

#### Revolution of the Earth

When the Earth moves around the Sun in its orbit, its motion is called **revolution**. The Earth takes  $365^{1/4}$  days to complete one revolution around the Sun. We consider only 365 days in a year and add up six hours ( $1/4^{\text{th}}$  day) over a period of four years. This one extra day is added to the month of February in the fourth year. Therefore, in every four years, the month of February has 29 days. The year with 366 days is known as a **leap year**.

The Earth revolves around the Sun in an elliptical orbit. Revolution of the Earth causes the changes in the seasons.

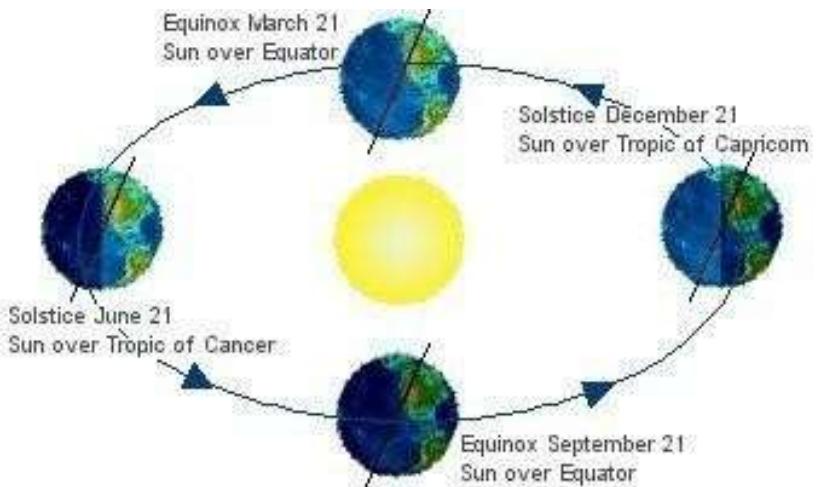


The Earth revolves round the Sun in an elliptical orbit.

### Summer and Winter Solstices

- For six months, (21 March to September 23) the Northern Hemisphere is tilted towards the Sun. The Sun's rays fall directly over the Tropic of Cancer resulting in summer season in the Northern Hemisphere.
- The summer season is characterised by longer days and shorter nights.
- At this time, the Southern Hemisphere is away from the Sun and receives the slanting rays of the Sun, thus experiencing the winter season.
- The winter season is characterised by shorter days and longer nights.
- A solstice is a day, when the Sun shines vertically over a Tropic (Cancer or Capricorn) in the afternoon, and the day is longest in that hemisphere.

- The Southern Hemisphere faces the Sun from 21 June to 22 December. During this time it experiences summers. This is the reason why Australia which lies in the Southern Hemisphere celebrates Christmas in the summer.
- On 22 December, the rays of the Sun fall directly over the Tropic of Capricorn. This is the longest day in the Southern Hemisphere (as it is the summer season) while in the Northern Hemisphere, it is the shortest day (as it is winter season). This is known as the **winter solstice**.



Diagrammatic representation of summer solstice, winter solstice and equinox

- On 21 June, sunlight falls vertically over the Tropic of Cancer. This is the longest day in the Northern Hemisphere and hence it is known as the **summer solstice**.
- On 21 March and 21 September, the Sun's rays fall directly over the equator. On both these days, the lengths of day and night are equal on all places on the Earth's surface. This is called **equinox**. This occurs as neither of the two poles is tilted towards the Sun.
- On 21 March, it is autumn in the Southern Hemisphere and spring in the Northern Hemisphere. On 23 September, it is autumn in the Northern Hemisphere and spring in the Southern Hemisphere.