

SSLC GEOGRAPHY UNIT:1

SEASONS AND TIME

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Seasonal change

- The winter, summer and the rainy seasons are experienced one after the other. Such a change on the earth is known as seasonal change.

Reasons for seasons

- Variations in the amount of sunshine received
- The earth's revolution
- The tilt of the earth's axis

REVOLUTION

- The earth revolve around the sun in an elliptical orbit. This motion is known as revolution.

Tilt of Earth

- The earth is tilted at an angle of $66\frac{1}{2}^{\circ}$ from the orbital plane.
- vertical plane this would be $23\frac{1}{2}^{\circ}$

Perihelion

The day on which the sun and the earth are closest is known as perihelion.

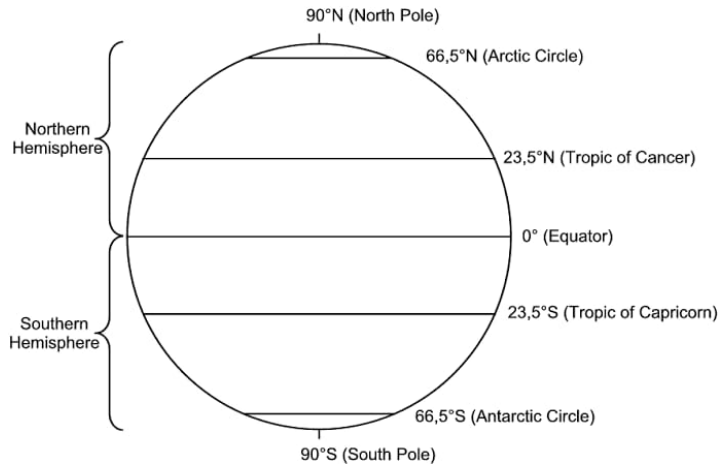
Aphelion

The day one which the sun and the earth are farthest is known as aphelion.

LEAP YEAR

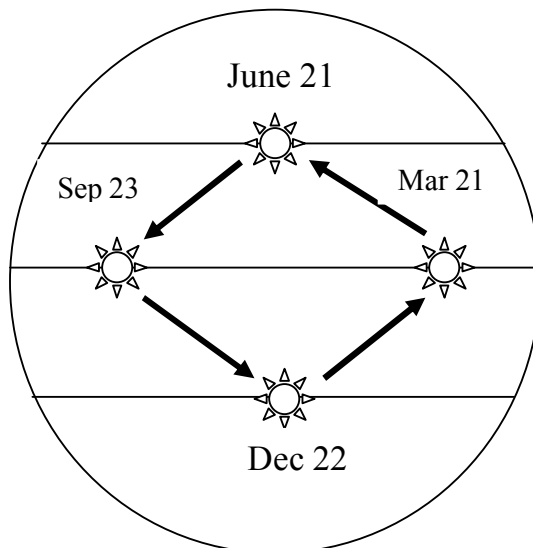
- Earth is required to complete a revolution is 365 days and 6 hours.
- 365 days = 1 year.
- The remaining 6 hours are treated as one day every 4 years, and every fourth year there are 29 days in February.
- Such years are known as leap year.

Important Latitudes



Parallelism of Axis

- The earth maintains its tilt throughout the revolution is known as parallelism of axis.
- **Apparent movement of the sun**
Since the parallelism is maintained throughout the revolution, the position of the sun in relation to the earth varies. The sun shifts apparently between tropic of cancer and tropic of Capricorn is known as apparent movement of the sun.



Equinox

- The apparent position of the sun during the earth's revolution will be over the equator on March 21 and September 23.
- Hence the length of day and night are equal on both hemispheres. These days are called equinoxes.

Summer Solstice

- The apparent position of the sun shifts from Equator on March 21 onwards and it reaches vertically above the Tropic of Cancer on 21 June.
- This day is known as Summer Solstice in the Northern Hemisphere.
- On this day the Northern Hemisphere experiences its longest day and shortest night.
- But Southern Hemisphere experiences its longest night and shortest day.

Summer season in Northern hemisphere

- The apparent movement of the sun shifts from tropic of cancer on June 21 and it reaches it vertically above the Equator on September 23. During this period summer seasons are experienced in Northern hemisphere.

Winter solstice

- The apparent movement of the Sun shifts from the Equator on September 23 and it reaches vertically above the Tropic of Capricorn on December 22.
- This day is known as Winter Solstice in the Northern Hemisphere.
- On this day the Northern Hemisphere experiences its shortest day and longest night.

What is the peculiarity of the day and the night in the Southern Hemisphere on 22 December?

- ✓ This day the Southern Hemisphere experiences its longest day and shortest night.

Winter season in Northern hemisphere

- The apparent movement of the sun shifts from Tropic of Capricorn on December 22 and reaches it vertically above the Equator on March 21. During this period winter seasons are experienced in Northern hemisphere.

Spring season

- Spring is the season of transition from winter to summer.
- The Northern Hemisphere experiences spring season between March 21 to June 21.

Features are :-

- The plants sprouting.
- Mango trees blooming.
- Jack fruit trees bearing buds.

Autumn

- Autumn is the season of transition from summer to winter.
- During September 23 to December 22 are autumn seasons are experienced in northern hemisphere.

Features :-

- Atmospheric temperature decreases.
- Shortening of day and lengthening of night.
- Trees sheds their leaves.

Utharayanam

- The northward apparent movement of the sun from Tropic of Capricorn to the Tropic of cancer is known as **Utharayanam**.
- During this period the duration of the day gradually increases in Northern hemisphere.

Dhakhinayanam

- The southward apparent movement of the sun from Tropic of cancer to the Tropic of Capricorn is known as Dhakhinayanam.
- During this period the duration of the day gradually increases in southern hemisphere.

Seasons and apparent position of the Sun

Months	The apparent movement of the sun	Seasons	
		Northern hemisphere	Southern hemisphere
From March 21 to June 21	From the Equator to Tropic of Cancer	Spring	Autumn
From June 21 to September 23	From Tropic of Cancer to the Equator	Summer	Winter
From September 23 to December 22	From the Equator to Tropic of Capricorn	Autumn	Spring
From December 22 to March 21	From Tropic of Capricorn to the Equator	Winter	Summer

Local Time

- The time estimated at each place, based on the apex position of the sun is termed as the local time.

Complications if there are several local times in a country?

- ✓ Cannot prepare a railway time
- ✓ Cannot give information on radio, Television programmes.
- ✓ Cannot prepare public examination time table around a country.

Calculation of Time: Basic information

- The angular distance of the Earth is 360°
- The time required to complete a 360° rotation is 24 hours.
- On converting 24 hours into minutes $24 \times 60 = 1440$ minutes.
- The time required to complete the rotation of 1° longitude is $1440 \div 360 = 4$ minutes.
- The time required for the rotation of 15° longitudinal area is $15 \times 4 = 60$ minutes (1 hour).
- As the earth rotates from west to east, time advances towards the east and recedes towards the west.

Greenwich Mean Time (GMT) and Time Zones

- The zero degree longitude is known as the Greenwich Meridian.
- It acquires its name from Greenwich, the place where the Royal British Observatory is situated and through which this line passes.
- Time is calculated worldwide based on the Greenwich Line.
- Hence this line is also known as the prime meridian.
- The local time at the prime meridian is known as the Greenwich Mean Time.
- Based on the Greenwich Meridian, the world is divided into 24 zones, each time zone with a time difference of one hour.
- These are known as time zones.
- The longitudinal extent of each time zone is 15° .

Standard Time

- Each country in the world considers the longitude that passes almost through its middle as the standard Meridian.
- The local time at the standard meridian is known as standard time.
- The time at the longitude that passes through the middle of a country is selected as the common time for the whole country.

Indian Standard time (IST)

- -The longitudinal extent of India is from 68°E to 97°E .
- The $82\frac{1}{2}^{\circ}\text{E}$ longitude which passes almost through the middle has been fixed as the standard meridian of India.
- The local time along this longitude is considered as the Standard Time of India.
- This is known as the Indian Standard Time.
- The difference between the Indian Standard Time and the Greenwich Mean Time is 5.30 hour advancing.

International Date Line

- 180° longitude is known as International Date Line.
- There is a difference of 24 hours, at 180° longitude to the east and west of Greenwich.
- If 180° longitude passes through a country, the places situated East and West of this line will be having two different days with 24 hours.
- To avoid this difficulty the line is drawn with bend.
- It passes through Bering Strait in Pacific Ocean.
- The travelers who cross this line from the East calculate the time by advancing it by one day and those who cross the line from the west deduct one day.

Calculate Time

- ❖ **If GMT is 12 noon, what will be the time in Newyork?**

Newyork is 74°W

- ✓ To rotate 1° longitude = 4 minutes.
- ✓ To rotate 74° = $4 \times 74 = 296$ minutes
- ✓ That means 4 hr 56 minutes
- ✓ As Newyork is situated in the West of Greenwich, 4 hrs 56 minutes deduct from the GMT.
- ✓ So the time at Newyork is : $12 - 4.56 = 7.04$ am.

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