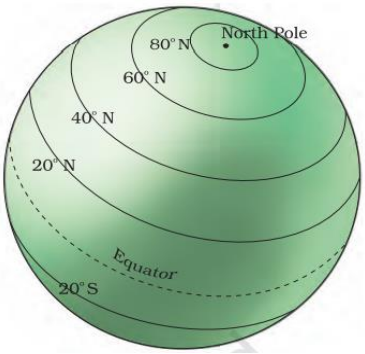
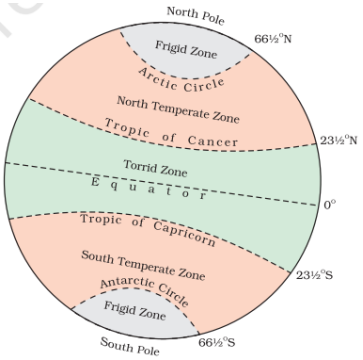
Chapter – 2: Globe – Latitudes and Longitudes

- Earth – not sphere – flat at poles – bulge out in middle
- **Globe** – true model – earth
- Globe – different size, type – not fixed – rotate on axis
- On globe – countries, continents, oceans – correct size
- Difficult to describe – location of point – how to locate – certain points of reference and lines
- Globe – needle fixed – tilted – axis – points – axis pass through – poles – North and South – move around needle – west to east – like earth
- Major difference – earth – no needle – axis – imaginary line
- Another imaginary line – globe – divided in 2 parts – **equator**
- Northern half – North Hemisphere – southern half – South Hemisphere – both equal
- Equator – imp. reference point – locate places
- Circles – parallel to equator – toward poles – **parallels of latitudes** – measured in degrees
- Equator – 0^0 – distance from equator to pole – $1/4^{th}$ of circle – $1/4^{th}$ of 360^0 – i.e., 90^0
- 90^0 north latitude – North Pole – 90^0 south latitude – South Pole
- Parallels – north of equator – 'North Latitudes' – Parallels – south of equator – 'South Latitudes'
- Chandarpur, Maharashtra – 20^0 N and Belo Horizonte, Brazil – 20^0 S

Important Parallels of Latitude

- 0^0 – equator, 90^0 N – North Pole, 90^0 S – South Pole
- 4 other imp. parallels –
  - Tropic of Cancer – $23½^0$ N
  - Tropic of Capricorn – $23½^0$ S
  - Arctic Circle – $66½^0$ N
  - Antarctic Circle – $66½^0$ S



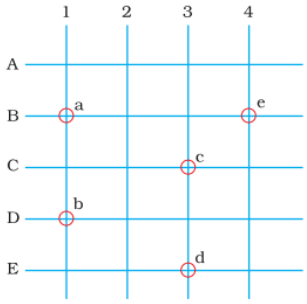


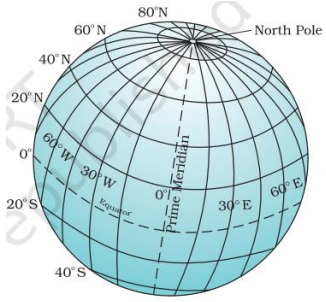
Heat Zones of the Earth

- Mid-day sun – overhead – at least once – all latitudes – between – Tropics of Cancer and Capricorn – maximum heat – **torrid zone**
- Mid-day sun – never overhead – beyond Tropics of Cancer and Capricorn – area between Tropic of Cancer and Arctic Circle in North – AND – area between Tropic of Capricorn and Antarctic Circle in north – moderate temperatures – **temperate zones**

- Area within Arctic Circle in North – AND – area within Antarctic Circle in South – very cold – sun does not rise beyond horizon – rays – always slanting – less heat – **frigid zones**

What are Longitudes?

- Locate place – more than latitude
- Tonga Islands, Pacific Ocean – AND – Mauritius Islands, Indian Ocean – same latitude – 20^0 S – how far East or west from line of reference
- Line of reference – North pole to South pole – meridians of longitudes – distance between them – degrees of longitude further divided into minutes – minutes into seconds
- Semi-circles – distance between them – decreases – towards poles – zero at pole – all meet
- All meridians – equal length – difficult to number them
- All countries – decided – count start from – meridian – passing through Greenwich – British Royal Observatory
- This meridian – **Prime Meridian** – 0^0 – count 180^0 East and 180^0 West
- Prime meridian and 180^0 meridian – divide earth in 2 halves – Eastern and Western hemispheres
- 180^0 E and 180^0 W – same line
- 



- Grid – parallel of latitude – meridians of longitude – locate points easily
- Dhubri, Assam – 26^0 N, 90^0 E
- Understand this – draw equidistant vertical and horizontal lines
- Label vertical with numbers and horizontal with letters
- Mark cross-section
- Vertical lines – East Longitudes | horizontal lines – North latitudes
- Point ‘a’ – B^0 N and 1^0 E

Longitude and Time

- Measure time – best way – movement of earth, moon, planets
- Local time – calculated by – shadow of sun – shortest at noon – longest at sunrise / sunset
- Prime meridian – Greenwich – sun – highest point – all places – along meridian – mid-day or noon
- Earth rotates – west to east – places east of Greenwich – ahead of Greenwich time – west of Greenwich – behind it
- Earth rotates 360^0 in 24 hours – 15^0 per hour – 1^0 per 4 minutes
- 12 noon at Greenwich –
    - 15^0 E of Greenwich – 60 minutes ahead – 1 p.m.
    - 15^0 W of Greenwich – 60 minutes behind – 11 a.m.

- Any place – adjust watch – 12 o'clock – sun overhead – mid-day – local time – all places – given meridian – same local time

Why Do We Have Standard Time?

- Local time – places – different longitudes – different
    - Difficult – prepare time-table – trains – cross different longitudes
- India – difference – 1 hour and 45 minutes – Dwarka, Gujarat and Dibrugarh, Assam
- Necessary – adopt local time – central meridian of a country – standard time
- India – longitude 82½^0 E (82^0 30' E) – standard meridian – local time – Indian Standard Time (IST)
- India – east of Greenwich – 5 hours and 30 minutes ahead of GMT
- Some countries – great longitudinal extent – adopted more standard times
- Russia – eleven standard times
- Earth – 24 zones – 15^0 each