

# Weather and Climate

Lesson No.	Title	Activity
13	Weather and Climate	Try to find out that which kind of weather and climate is found in your area.

## Meaning

The temperature, atmospheric pressure, winds and precipitation are main elements of weather have an important effect on our lives. For example the houses we construct, the clothes we wear and the food we prefer mainly depend on weather and climatic conditions.

## Water Vapour in the Atmosphere

Water vapour is a highly variable component of the atmosphere. Its proportion varies from zero to four percent by volume of the atmosphere.

- Water can exist in the air in all the three states of matter i.e. solid (ice-crystals), liquid (droplets of water) and gaseous (water vapour).

## Weather and Climate

### Weather

Temperature, pressure, wind, humidity and precipitation, interact with each other and known as the elements of both weather and climate.

Weather is the atmospheric condition of a place for a short duration with respect to its one or more elements.

### Weather Forecast

- Farmers, sailors, aviators, tourists and many others are interested to know the weather conditions in advance for their own benefits.
- The weather office collects data on temperature, wind, cloud cover, rainfall and other atmospheric phenomena across the country.
- Similar information is also received from the ships sailing in the high seas.
- The analysis of these data thus collected, helps in forecasting weather conditions for the next 48 hours or even for a week.

### Season

- Season is specified periods in a year which have similar weather conditions.
- Season is a period of the year characterized by a particular set of weather conditions resulting from the inclination of the earth's axis and the revolution of the earth round the sun. The same cycle of season is repeated year after year.

## Climate

- The average weather conditions, prevalent from one season to another in the course of a year, over a large area is known as climate.
- The average of these weather conditions is calculated from the data collected for several year (about 35 years) for a larger area.

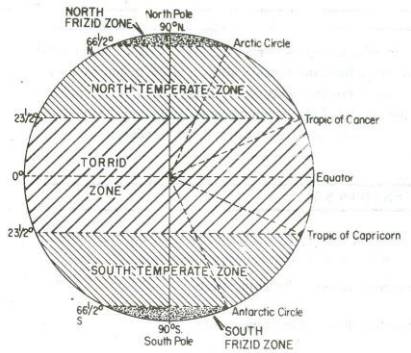
## Factors affecting Climate

- Latitude or Distance from the Equator- The places near the equator are warmer than the places which are far away from it.
- Altitude or the Height from the mean sea level
- Continentally or the Distance from the Sea- The water is a bad conductor of heat i.e. it takes longer time to heat and longer time to cool. Due to this moderating effect of the sea, places near the coast have low range of temperature and high humidity.
- Nature of the Prevailing Winds- The on-shore winds bring the moisture from the sea and cause rainfall on the area through which they pass. The off-shore winds coming from the land are dry and help in evaporation.
- Cloud Cover- In areas generally of cloudless sky has large diurnal range in temperature. On the other hand under cloudy sky and heavy rainfall areas the range of temperature is very small.
- Ocean Currents
- Direction of Mountain Chains- The mountain chains act as natural barrier for the wind.
- Slope and the Aspect
- The Nature of the Soil and Vegetation Cover

## Classification of Climate

Greeks were first to classify the world climates on the basis of the distribution of temperature and insolation.

The following are the five thermal zones-



## The Thermal Zones

### Torrid Zone

- It is situated between the Tropic of Cancer ( $23\frac{1}{2}^{\circ}\text{N}$ ) and Tropic of Capricorn ( $23\frac{1}{2}^{\circ}\text{South}$ ).
- The sun's rays are almost vertical throughout the year in this zone.
- The mid-day sun is overhead at equator on equinoxes, i.e. on 21st March and 23rd September.
- It is also overhead at Tropic of Cancer on 21st June and at Tropic of Capricorn on 22nd December.

### Temperate Zone

- The North Temperate Zone lies between Tropic of Cancer ( $23\frac{1}{2}^{\circ}\text{North}$ ) and Arctic Circle ( $66\frac{1}{2}^{\circ}\text{North}$ )
- The South Temperate Zone lies between Tropic of Capricorn ( $23\frac{1}{2}^{\circ}\text{South}$ ) and Antarctic Circle ( $66\frac{1}{2}^{\circ}\text{South}$ ).
- The difference between the duration of the day and night increases towards the poles.

### Frigid Zones

- The North Frigid Zone lies between Arctic Circle ( $66\frac{1}{2}^{\circ}\text{N}$ ) and North Pole ( $90^{\circ}\text{North}$ ). The South Frigid Zone lies between Antarctic Circle ( $66\frac{1}{2}^{\circ}\text{South}$ ) and South Pole ( $90^{\circ}\text{South}$ ).
- During winter season, the sun does not rise above the horizon for almost six months.

### Climatic Types

- The most widely used system of climatic classification in its various modified forms is that of Wladimir koeppen (1846-1940).
- It is based upon temperature, precipitation and their seasonal characteristics.
- The world has been divided into five climatic groups and they are further sub-divided into 13 climatic types. They are as follows:

I Climatic Groups	Climatic Types
(A) Tropical climates (hot all seasons)	Af (i) Tropical rain forest Aw (ii) Savanna Climate Am (iii) Monsoon Climate
(B) Dry climates	Bw (iv) Desert Climate Bs (v) Steppe Climate
(C) Warm temperate rainy or Middle latitude rainy climates (mild winters)	Cs (vi) Mediterranean Climate Cw (vii) China Type Climate Cf (viii) West European Climate
(D) Humid Middle latitude climates (severe winters)	Dw (ix) Taiga Climate Df (x) Cool East-coast Climate (xi) The Continental Climate
(E) Polar climates	Et (xii) Tundra Climate Ef (xiii) Ice-cap Climate

### Evaluate Yourself

1. Explain how weather forecast can be useful in our daily life.
2. Differentiate between weather and climate.
3. Describe the factors affecting the climate.