Chapter- 4

climate

STUDY NOTES

Let's Learn

When we use the word '**Weather**' and the word '**Climate**' , do the words mean the same thing, or are they different?

Weather is the state or condition of the **atmosphere** at a place over a short period of time. It can change every few hours in the course of a day. A place that is experiencing a violent storm right now, might have had calm, sunny weather just a few hours ago. Weather can be described as hot, cold, windy, humid, cloudy or rainy.

Climate, on the other hand, is the average weather conditions over a large area across a longer period of time (of 30 years or more). For example, we can say that north India has an **extreme climate** with hot summers and cold winters; or that the coastal plains of India have an **equable climate,** with no marked seasonal changes. Unlike weather, the climate of a region stays constant over long periods of time.

Factors influencing climate

Climate is influenced and controlled by certain factors. Main among these are latitude or distance from the equator, altitude, humidity, precipitation, and wind.

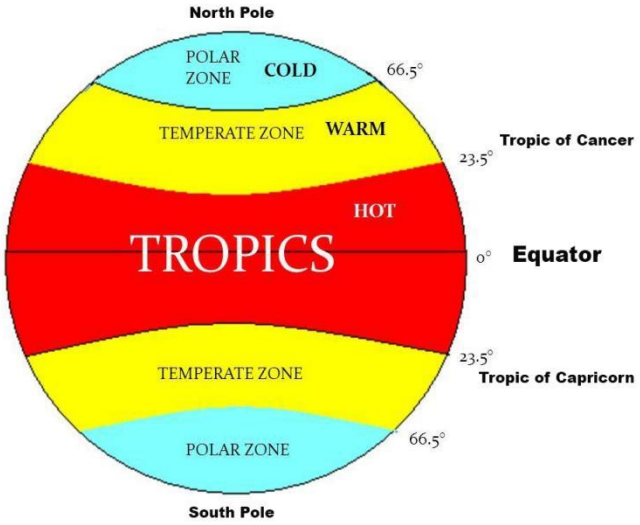
Latitude

Latitude, or distance from the equator, is one of the most important factors affecting the climate of a place. The further one goes from the equator the colder it gets. Therefore, places near the equator are hotter than places at higher latitudes. As a rule, the higher the latitude, the colder the climate of the place. Different parts of the Earth, therefore, receive different amounts of heat from the Sun. Depending on the amount of heat received, there are three **climatic** or **heat zones** on the Earth.

Heat zones of the Earth

As we have already seen, not all parts of the Earth receive the same amount of sunlight from the Sun. As a result of the spherical shape of the Earth, and its tilted axis, some parts receive more heat and some receive less.

Based on the amount of heat received, the Earth is divided into three heat zones - **the torrid zone, the temperature zone and the frigid zone.**



Altitude

Altitude, or the height of a place above the **sea level,** also affects the climate of a place. Temperature decreases with altitude. It does so at the rate of around 6.5° Celsius per 1000 metre rise in altitude. Thus, the higher we go, the cooler it gets. For example, during summer, temperatures over the plains of north India reach 40°C. But places in the mountains, like Shimla and Dehra Dun, are much cooler at 20-25°C. That is why people in India travel to hill stations during summer.

Distance from the sea

Places located near the sea have a **moderate** climate, that is, they are neither too hot in summer, nor too cold in winter. On the other hand, places located in the interior of continents have an **extreme** climate. They have very hot summers and extremely cold winters.

This happens because oceans and seas take longer to heat up and cool down than land does. As a result, during summers, cool winds blow from the sea during summers, cooling places along the coast. And during winters, warm winds blow from the sea during winters, warming places along the coast. Thus, places along the coast are cooler in summer and warmer in winter than places located inland at the same latitude.

For example, Edinburgh in Scotland and Moscow in Russia lie along similar latitudes. But Edinburgh has milder winters because it lies on the coast, unlike Moscow, which has severe winters because it lies far inland.

Humidity

The atmosphere contains water vapour. The amount of water vapour in the air is called **humidity.** When the humidity is high, we feel sticky and hot and sweat a lot. When the humidity is low, our skin feels dry and our lips start chapping. Places near the sea and other water bodies have high humidity, while places far away from it have low humidity. Places with higher humidity experience more rain. So, hot and humid places, like those lying along the equator, have heavy rain, while deserts have very little humidity and therefore receive almost no rainfall.

Winds

Air in motion is called wind. Warm winds that blow in from the sea are full of moisture. They bring rainfall to the coastal areas.

Winds that blow from the desert are hot and dry. They raise the temperature of the lands over which they blow. On the other hand, cold winds that blow from the polar regions cause temperatures to fall sharply.

Let's know more

Mark the following sentences as True or False.

- ✧ New Delhi has an equable climate.
- ✧ Southern India does not experience snowfall because it lies in the torrid zone.
- ✧ Places that lie near the sea usually experience high humidity.
- ✧ People travel to the hills during winter.
- ✧ The polar region are cold because they receive the direct rays of the Sun.

Let's Do

A. Fill in the blanks.

1. The condition of the atmosphere at a particular place and time is called _____.

2. The rays of the Sun fall vertically on land near the _____, but are slanting near the _____.

3. The heat zone within which the Equator lies is the _____ zone.

4. The heat zone farthest from the Equator is the _____ zone.

5. The heat zone which enjoys a mild climate is the _____ zone.

6. The amount of water vapour in the air is known as _____.

7. As we go up on a mountain, it becomes _____ (cooler/warmer)

B. Write T for true and F for false sentences.

1. Climate changes from day to day.

2. The air in deserts has low humidity.

3. During the summer months, days are longer near the Equator than far away from it.

4. Most places in the Temperate Zone have a mild climate.

5. The climate near the Equator is hot and wet.

Understand and Answer

C. Answer the following questions.

1. What is the difference between weather and climate?

2. How does the climate of a place affect the people living there?

3. Name the five important factors that determine the climate of a place.

4. Why do areas near the Equator receive more heat from the Sun, than those near the poles?

5. Where are the following heat zones located? Describe the general climate of each zone.

a. Frigid Zones; b. Temperate Zones; c. Tropical zone

6. How do winds affect the climate of a place?

7. How is the humidity in Chennai different from that of Jaisalmer in the Thar Desert?

Teacher's Note

Shiva is from Chennai (which is at sea level) where the average temperature in June is 42°C. If Shiva travelled to the hill station of Kodaikanal (which is at a height of 2133 m), what kind of temperature would he experience?

Improve your G.K

- Which country will host the World Environment Day 2021 event? (Pakistan)

- What is the theme of World Environment Day 2021? (Ecosystem Restoration)
- The first World Environment Day was held in which year? - 1974
- When is World Environment Day observed? 5th June
- When was Environment Day observed for the first time? 1972

ANSWER KEY

Let's know more

Mark the following sentences as True or False.

- ✧ False
- ✧ True
- ✧ True
- ✧ False
- ✧ False

Let's Do

A. 1. Weather

2. Equator, poles
3. Torrid
4. Frigid
5. Temperate
6. Humidity
7. Cooler

B.1. F

2. T
3. F
4. T

5. T

Understand and Answer

C.1. Difference between weather and climate:-

WEATHER	CLIMATE
1. Weather is the condition of the atmosphere at a particular place and time.	1. Climate is the average weather condition of a place over a long period of time.
2. Atmospheric conditions can change within a short period like minutes, hours, days, etc.	2.Atmospheric conditions remains unchanged over a long period of time.
3. The study of weather forecasting is known as meteorology.	3.The study, observe and predict the changes in climate is known as climatology.

2. The climate of a place affects the people living there in many ways. Like-

i. The clothes they wear.

ii. The food they eat.

iii. The types of houses they live .

3. Five important factors that determine the climate of a place are-

i. Distance from the Equator

ii. Height above sea level

iii. Distance from the sea

iv. Winds

v. The amount of moisture in the air

4. Areas near the Equator receive more heat from the Sun because:-

i. Sun rays are vertical or direct at the Equator and slanting at the poles.

ii. The direct rays have to heat up a smaller area and slanting rays have to heat up a larger area of the Earth's surface.

Hence, places near the Equator get heated more than places near the poles.

5. a) Frigid Zones -

i. Heat zone between Arctic Circle and the North Pole in Northern Hemisphere - North Frigid Zone, Climate - Very cold.

ii. Heat zone between Antarctic Circle and the South Pole in Southern Hemisphere - South Frigid Zone, Climate - Very cold.

b) Temperate Zones-

i) Heat zone between Tropic of Cancer and the Arctic Circle in Northern Hemisphere - North Temperate Zone, Climate - Mild (neither hot nor cold)

ii) Heat zone between Tropic of Capricorn and the Antarctic Circle in Southern Hemisphere - South Temperate Zone, Climate - Mild (neither hot nor cold)

c) Tropical Zone -

i) Heat zone between the Tropics of Cancer and Capricorn - Tropical or Torrid Zone, Climate - Hot and wet

6. Winds flow in particular directions in different parts of the world. They may be -

i) Hot wind - Raise the temperature of the lands over which they blow.

ii) Cool wind - Blow from the Polar regions fall the temperature over which they blow.

iii) Dry or warm wind - Blow from the sea are full of moisture bring rainfall to coastal areas.

7. Difference in humidity in Chennai and Jaisalmer -

Chennai	Jaisalmer
i) It is a coastal area	i) It is in Thar Desert
ii) The air is laden with moisture and thus the humidity level is high.	ii)The air has less moisture due to lack of availability of water and thus humidity level is low.