Air pressure: Air pressure is defined as the pressure exerted by the weight of air on the earth's surface. As we go up the layers of atmosphere, the pressure falls rapidly. The air pressure is highest at sea level and decreases with height. Horizontally the distribution of air pressure is influenced by temperature is high the air gets heated a rises.

- This creates a low-pressure area. Low pressure is associated with cloudily skies and wet weather. In areas having lower temperature, the air is cold. It is therefore heavy. Heavy air sinks and creates a high pressure area. High pressure is associated with clear and sunny skies.
- The air always moves from high pressure areas to low pressure areas.

Atmospheric Pressure: Air has weight and it exerts pressure on the surface of the Earth. This Pressure is called Atmospheric Pressure.

Factors Influencing Atmospheric Pressure: Temperature and altitude influence atmospheric pressure. Atmospheric pressure decreases with altitude. The moisture in the air also affects atmospheric pressure. Moist air exerts less pressure than dry air.

Measuring Pressure: Air Pressure is measured with an instrument called barometer. Atmospheric pressure is measured in millibars (mb).

Wind: The movement of air from high pressure area to low pressure areas is called wind. Winds can be broadly divided into three types.

Types of winds

Planetary Winds: These winds are also known as Permanent winds. They blow in a particular direction throughout the year. They are of three types:

Trade Winds-These winds move from the subtropical high pressure area to the low pressure areas on the equator. These winds follow Ferrel's Law which states that all the moving bodies on the surface of the earth deflect towards their right in the Northern Hemisphere and towards their left in the Southern Hemisphere.

Westerlies-They move from the subtropical high pressure belt to the sub-polar low pressure belts.

Polar Winds- These winds blow in the same direction as the trade winds. Monsoon winds and sea and land breezes are examples of this kind of winds.

Monsoon Winds- They have a special impact on the climatic condition of India. They change their directions once every six months.

Land and Sea Breeze-The phenomenon of land and sea breeze is experienced by people living in coastal areas. During the day, land and becomes hotter than the sea. The cooler air from the sea moves towards the land during the day. At night, the land cools down much faster than the sea. The pressure over the sea is lower than the pressure on land, the air from and starts blowing towards the sea, this dry wind is called land breeze.

Seasonal winds- these winds change their direction in different seasons. For example monsoons in India.

Local winds- these blow only during a particular period of the day or year in a small area. For example, land and sea breeze. These winds blow over a small area during a particular period. They blow for a short time and re mostly seasonal. Some local winds are:

Loo- This is the local dry wind and blows from the desert of Rajasthan toward the Ganga Plains. It blows in summer and causes heatstroke over northern India.

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Chinook-Chinook means the "snow-eater". This warm dry wind help to clear the snow and ice rapidly after winters.

Foehn- Foehn is quite similar to Chinook as it blows down the southern parts of the Alps during winters.

Measuring Winds: The speed of wind is measured anemometer.

Moisture: When water evaporates from land and difference water bodies, it becomes water vapor. Moisture in the air at any time is known as humidity.

- When the air is full of water vapour we call it a humid day. As the air gets warmer, its capacity to hold the water vapour increases and so it becomes more and more humid.
- When the water vapour rises, it starts cooling the water vapour condenses causing formation of droplets of water. Clouds are just masses of such water droplets.
- Precipitation comes down to the earth in liquid form is called rain. Most of the ground water comes from rainwater. Plants help preserved water.
- On the basis of mechanism, there are three types of rainfall: the convectional rainfall, the orographic rainfall and the cyclonic rainfall. Rainfall is very important for the survival of plants and animals. It brings fresh water to the earth's surface. If rainfall is less-water scarcity and drought occur. On the other hand if it is more, floods take place.

Evaporation: When water evaporates from land and other water bodies, it changes into water vapour, which is the most important form of moisture in the atmosphere. Water can change from one form to another by absorbing or giving out heat. During the day, water bodies on the earth absorb heat and some of the water changes into water vapour and goes into the atmosphere. The process by which water chances into water vapour is known as **evaporation.**

The rate of evaporation is highest on a hot, windy and dry day and the lowest on a cold and wet day.

Humidity:The amount of water vapour present in the atmosphere is known as humidity. Humidity decreases in winter and increases in summer and rainy seasons. It also decreases as we go higher into the atmosphere. When it is hot we sweat and when this sweat evaporates we feel cool. But when the humidity is high in the atmosphere, the rate of evaporation is reduced and the sweat does not evaporate. This makes us feel hot and uncomfortable. At a particular temperature, the ratio between the actual amount of water vapour present in the air and the maximum capacity of the air to hold moisture at the same temperature is its relative humidity. It always expressed in percentage. **Condensation:** As the moist air rises up, it becomes cool and the water vapour changes into small drops o water. This process is known as **condensation.** Dew, fog, frost and clouds are the important forms of condensation.

Clouds: When small drops of water condense around dust or smoke particles in the air, clouds are formed. Clouds are of various types, such as cirrus (feather white), cumulus (white or grey), nimbus (dark and full of water) and stratus (thin white sheets). In winters, when moist air comes in contact with the cold ground surface, water vapour changes into water and rest as dew drops on the leaves and grass.

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Fog and Mist: During winter months, the present in the atmosphere condense particles present in the atmosphere and mist. This normally occurs in morning and reduces visibility.

Frost: During cold weather, when temperature falls below freezing point, the water vapour converts into ice crystals and covers the grass and plants.

Precipitation:

• Clouds have millions of tiny water droplets. When these droplets of water join together, they grow in size and are unable to float in the air.

• Then they fall on the earth's surface as raindrops. This process is called precipitation. Rain, snow, sleet and hailstones are the various forms of precipitation. Rain is the most important form of precipitation. Most of the groundwater comes from rain. Rainfall is very important for the survival of plants and animals as it brings fresh water to us.

• If rain water is not enough, then drought and famine may hit us and if it is too much, floods may wreck our lives. Rainfall is of three types.

1. **Conventional rainfall**: When air comes in contact with the earth's hot surface, it gets heated and rises up in the form of an air current. When cool air comes in to take the place of hot air, convectional air currents are formed.

• In the upper layers of the atmosphere, this warm air cools down. Condensation occurs and clouds are formed. These clouds produce sudden and heavy rainfall.

2. **Relief Rainfall**: This occurs when a mountain lies in the path of moist wind. It is else called orographic rainfall as it is caused by the orography of the land.

3. Cyclonic rainfall: In a cyclone, when warm and cold air from opposite directions meet, a zone of separation called fronts, forms at the place where they met. Warm air being lighter rises obliquely over the heavy cold air. As it rises, it cools down, condenses and causes rainfall along the path of the cyclone. this type of rainfall is also called frontal rainfall.

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