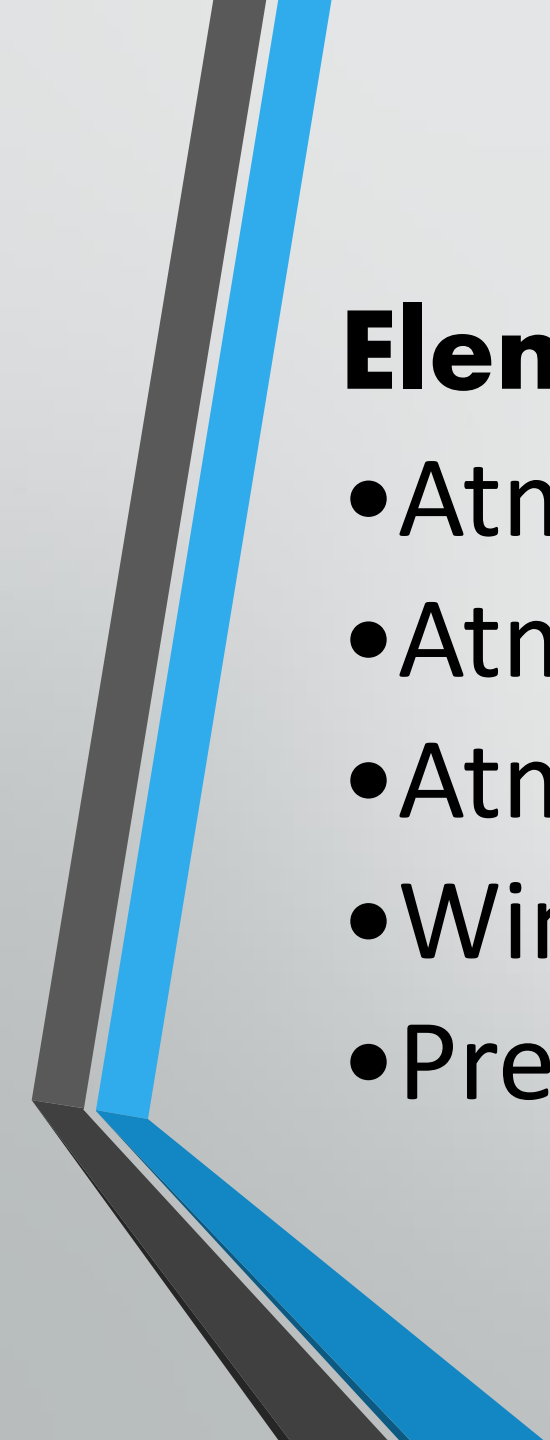




ELEMENTS OF WEATHER AND CLIMATE

	WEATHER	CLIMATE
Definition-	Conditions of atmosphere prevailing on a limited area over a short period of time	Conditions of atmosphere that prevail over a long period, say 30 years.
Time Period	Changes day to day, hour to hour, and even in minutes.	Prolongs the same pattern over a long time, more than 30 years
Major Elements-	clouds, rain, sunshine, breeze, thunderstorm, hail , snow, storms, cold fronts, heat waves.	Temperature, pressure, Humidity, precipitation, winds.
Forecasts/ Determining Factors	By collecting meteorological data i.e. temperature, amount of rain, humidity, wind speed.	Aggregating weather forecasts for over 30 years
Effect On Human Life	Weather effects our day to day life, eg. rainy days we would carry an umbrella.	Climate effects the lifestyle of people, eg. people's way of dressing, eating habits etc.



Elements of Climate

- Atmospheric Temperature
- Atmospheric Pressure
- Atmospheric humidity
- Winds
- Precipitation

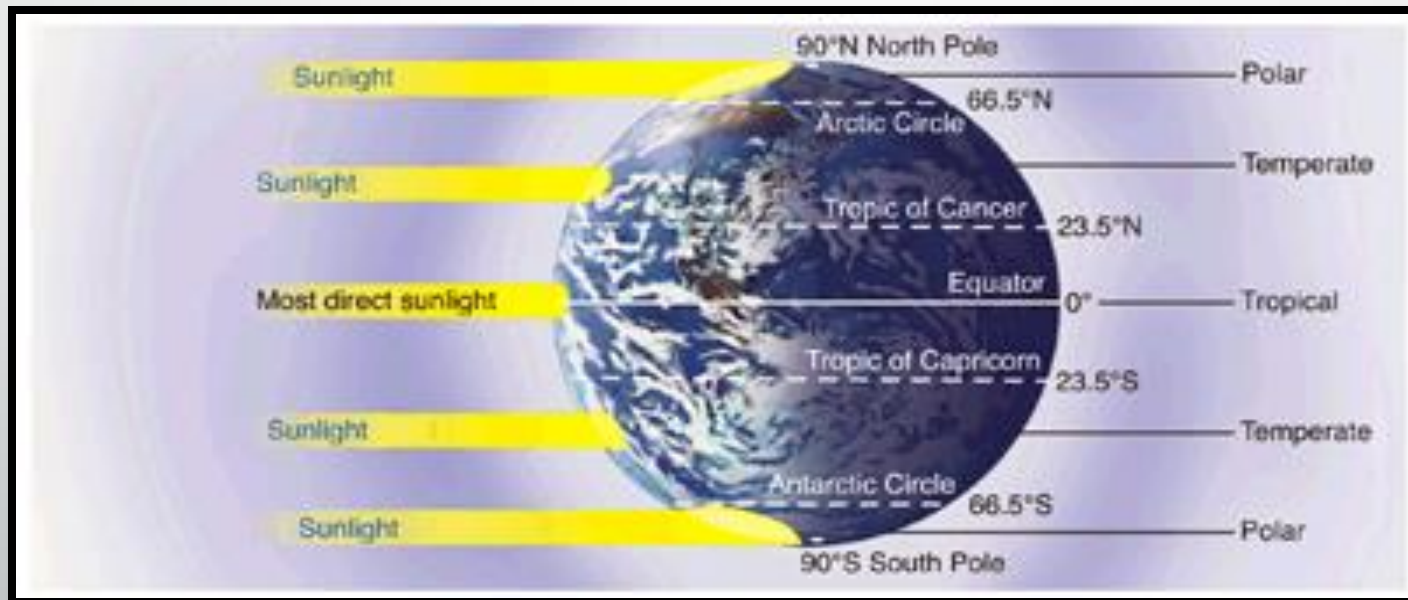
1. Temperature

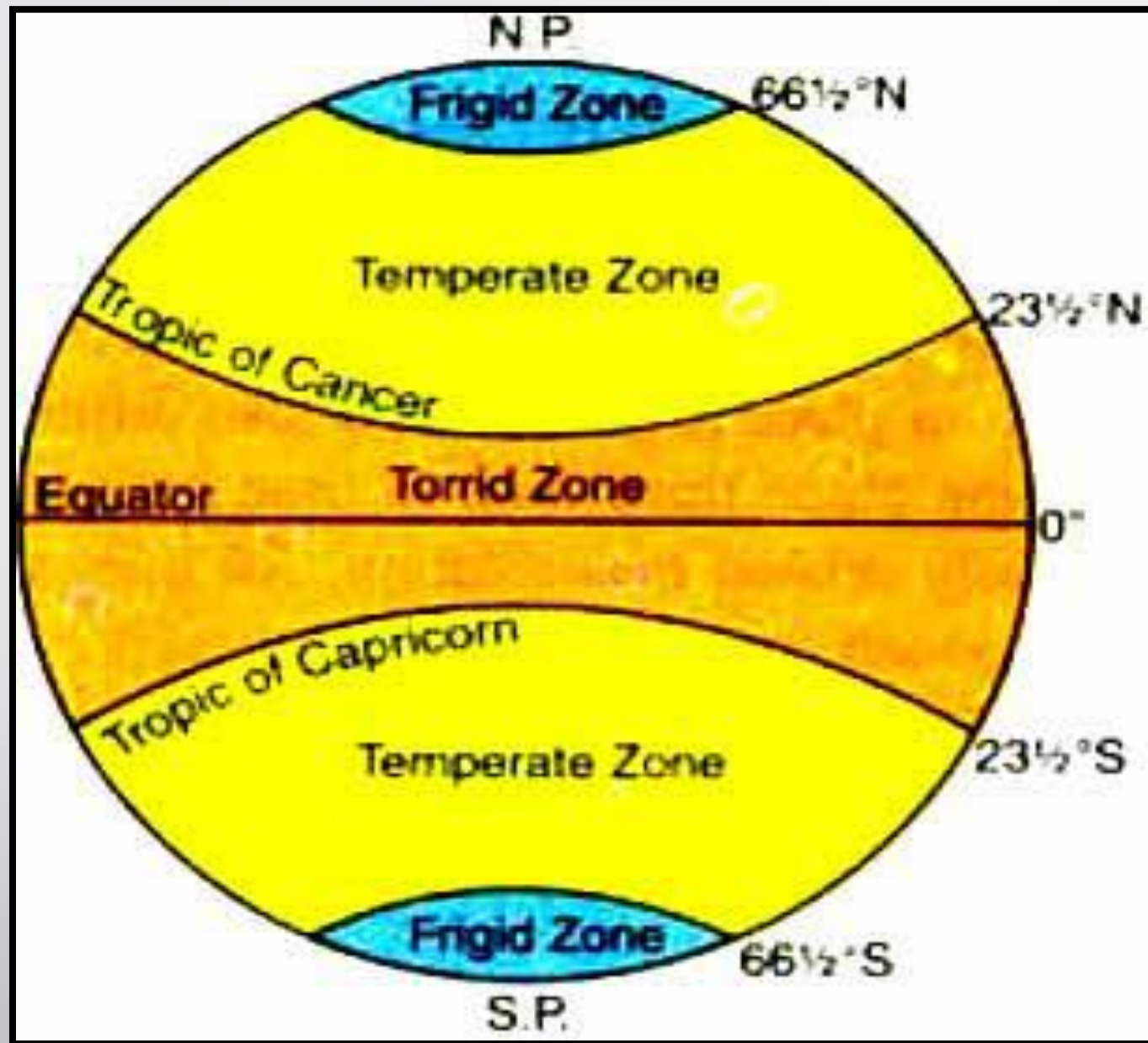
- ❑ The amount of hotness and coldness of the atmosphere is called temperature.
- ❑ Temperature is measured by an instrument – **Thermometer**
- ❑ **Maximum and Minimum thermometer** is used to measure the daily range of temperature.
- ❑ The difference between maximum and minimum temperature of a day is called **Diurnal range of temperature**.
- ❑ Unit to measure temperature – degrees Celsius or Centigrade [°C] and degrees Fahrenheit [° F]

❑ The temperature of a place is mostly related to the amount of sunshine received – INSOLATION

❑ **INSOLATION** – INcoming of **SOL**ar radi**ATION** – amount of sunlight reaching the earth.

❑ The temperature corresponds to the heat zones – **Torrid, Temperate and Frigid.**

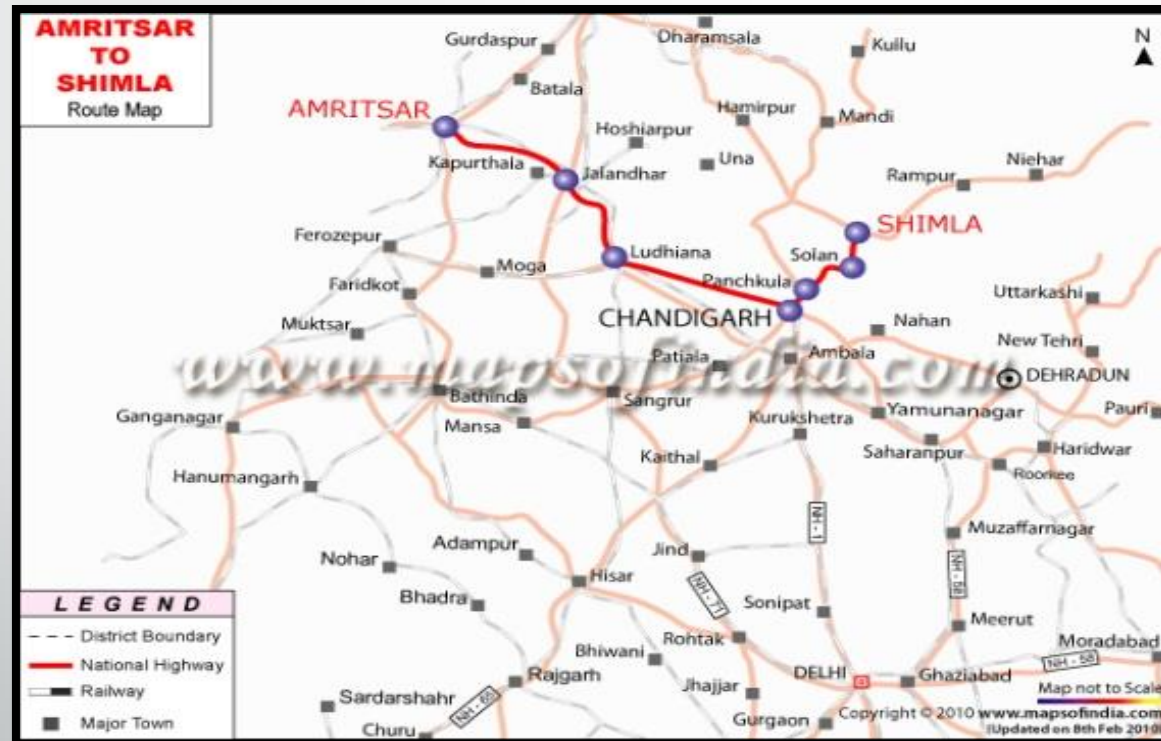




❑ The heat zones of the earth correspond to the different latitudes. Temperatures change with change in latitudes.

Then Why is it that.....

❑ **Amritsar** and **Shimla** both lie on the same latitude - 31°N ; yet, Shimla is cooler than Amritsar.



- ❑ **Addis Ababa**- (Capital of Ethiopia) located at equator, has a comparatively cool climate.



- ❑ **WHY???** Reason - **Height above sea level or altitude** of a place. (Shimla and Addis Ababa both located on high elevation)

FACTORS AFFECTING TEMPERATURE OF A PLACE

- **Latitude** - Distance from the equator
- **Altitude** - height above sea level
- **Distance from the sea** and other large water bodies – places near the sea have moderate climate.
- **Winds** - winds coming from cooler regions will bring cooler effect
- **Ocean currents** - The warm ocean currents bring in warmer temperatures to the places they flow past. Similarly the cold currents lower the temperatures.

2. Air Pressure

The pressure created by air on the earth surface is known as the air pressure.

- ❑ Ever wondered why we don't feel the pressure even though multiple layers of air are creating the pressure on us constantly?

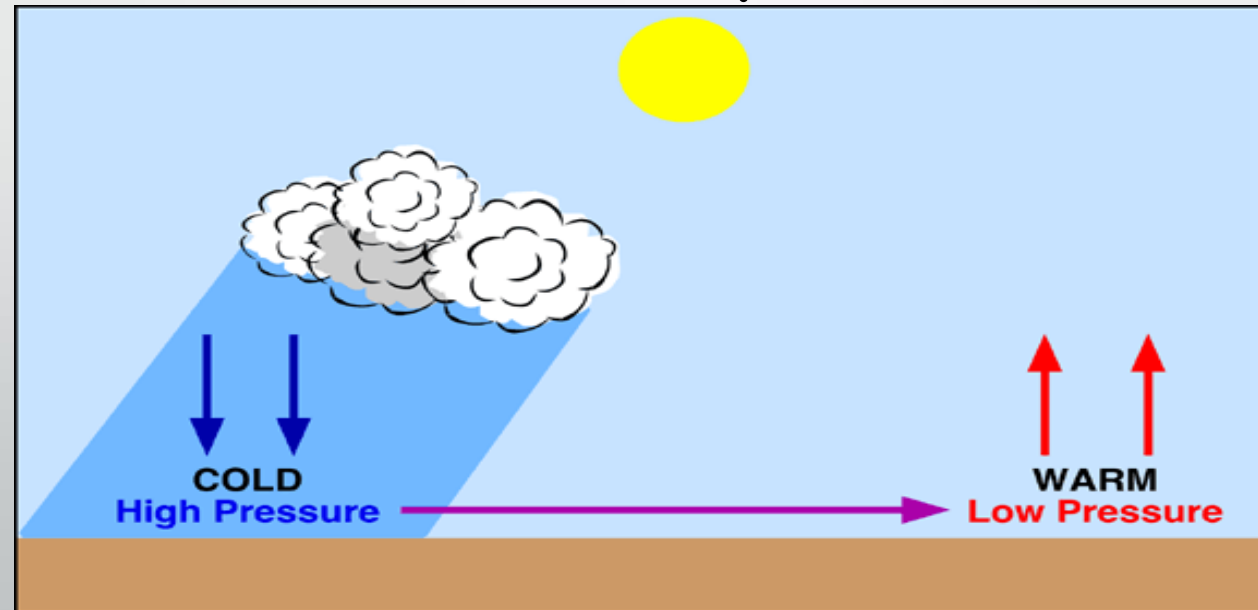


- ❑ It is because the air is exerting pressure from all sides and also our bodies are exerting a counter pressure back on the air.

❑ The heated air becomes lighter and rises up, hence the air pressure is low in areas of hotter temperatures.

❑ The cold air becomes heavier and sinks down, hence the air pressure is high in the areas of cooler temperatures.

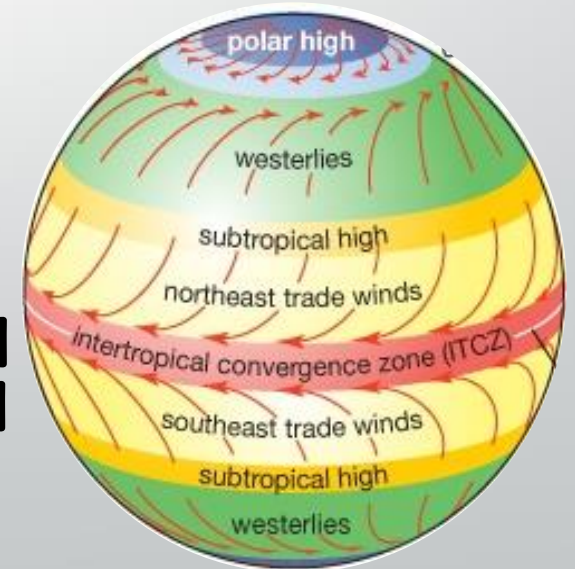
❑ Hence we can say that temperature and pressure are inversely proportional. That means when the temperature is high, air pressure is low ; and when the temperature is low, air pressure is high.

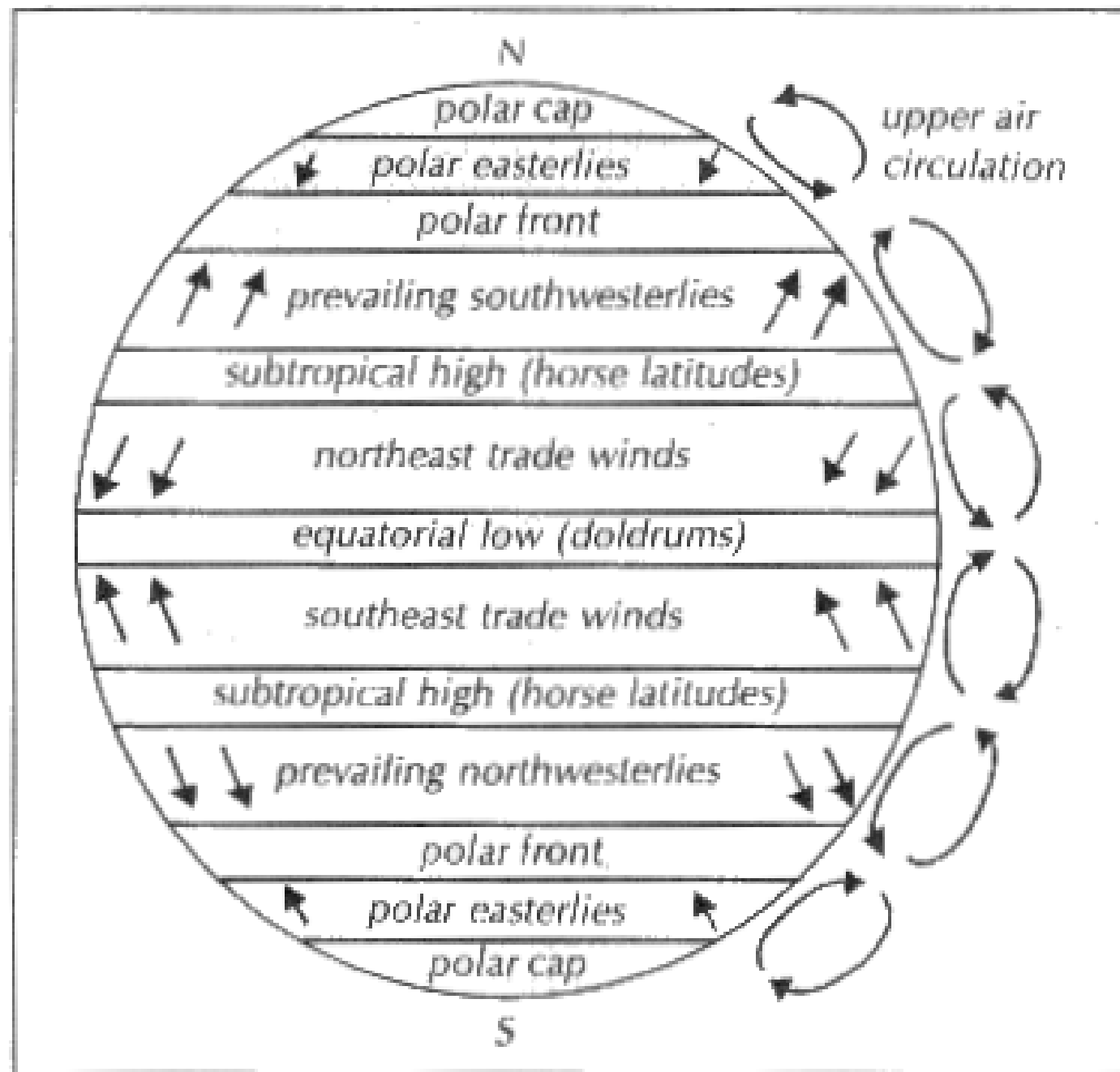


PRESSURE BELTS OF THE EARTH

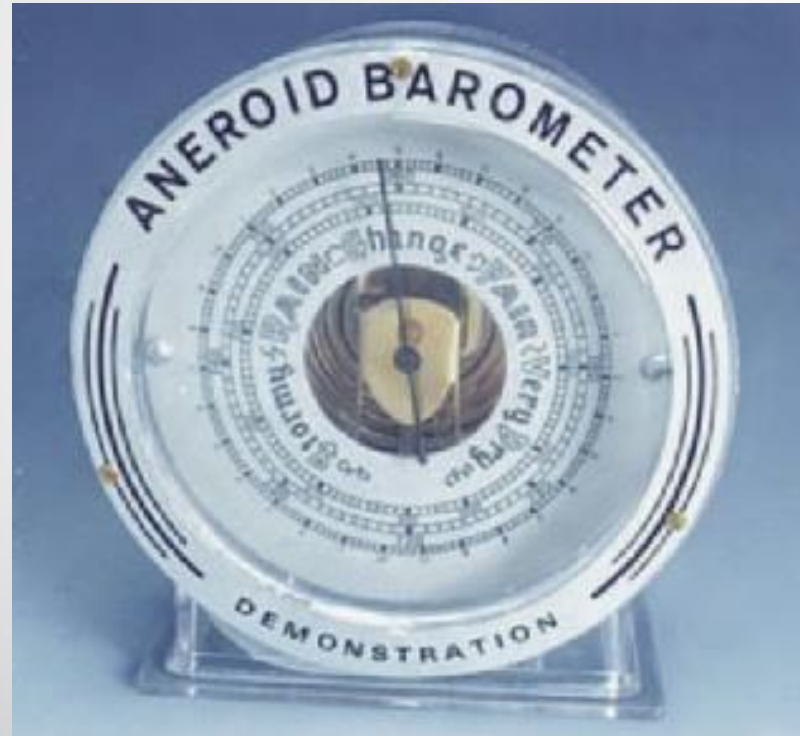
- ❑ Just as there are different zones of temperature on the earth corresponding to latitudes.....
- ❑ Similarly there are different belts of varying pressure conditions corresponding to different temperature conditions in these latitudes.
- ❑ There are 4 major **pressure belts** on the earth surface -

1. Equatorial low pressure belt. [5° N - 5° S]
2. SubTropical high pressure belt. [30° - 35° N - 30° - 35° S]
3. Sub Polar low pressure belt. [60° - 65° N - 60° - 65° S]
4. Polar high pressure belt [85° - 90° N - 85° - 90° S]





- ❑ Air pressure is measured by an instrument called **Barometer**.
- ❑ The unit of measuring air pressure is **millibars**



3. Winds

- ❑ The difference in pressure conditions causes winds.
- ❑ The instrument to measure wind direction is called wind wane



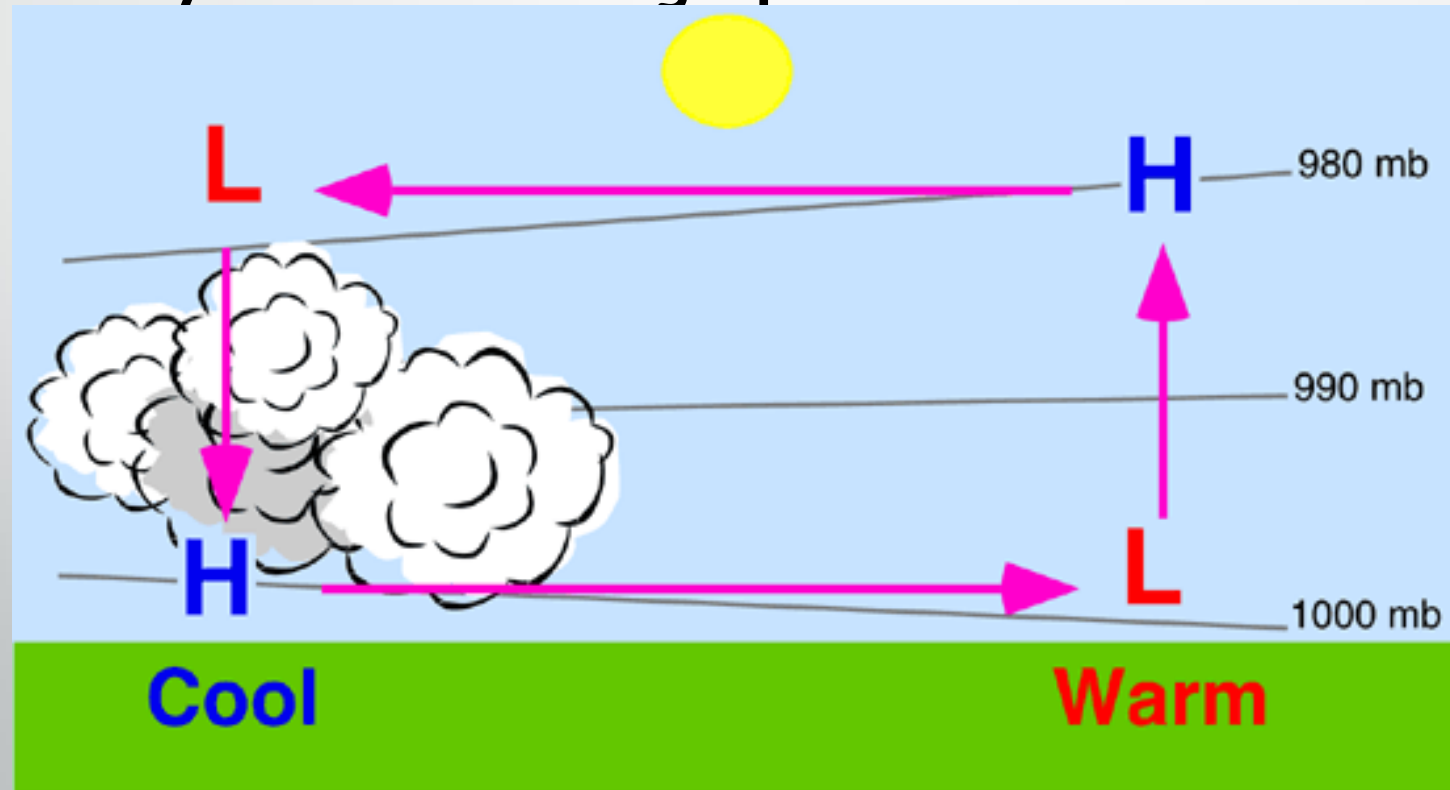
- ❑ The instrument to measure wind speed is called an anemometer.



❑ The air masses in the warmer regions rise up. The air masses from the cooler regions rush to take its place. This horizontal movement of the air on the surface of the earth is called **wind**.

❑ The vertical movement of the warm air rising up and cool air sinking down is called **Air Current**.

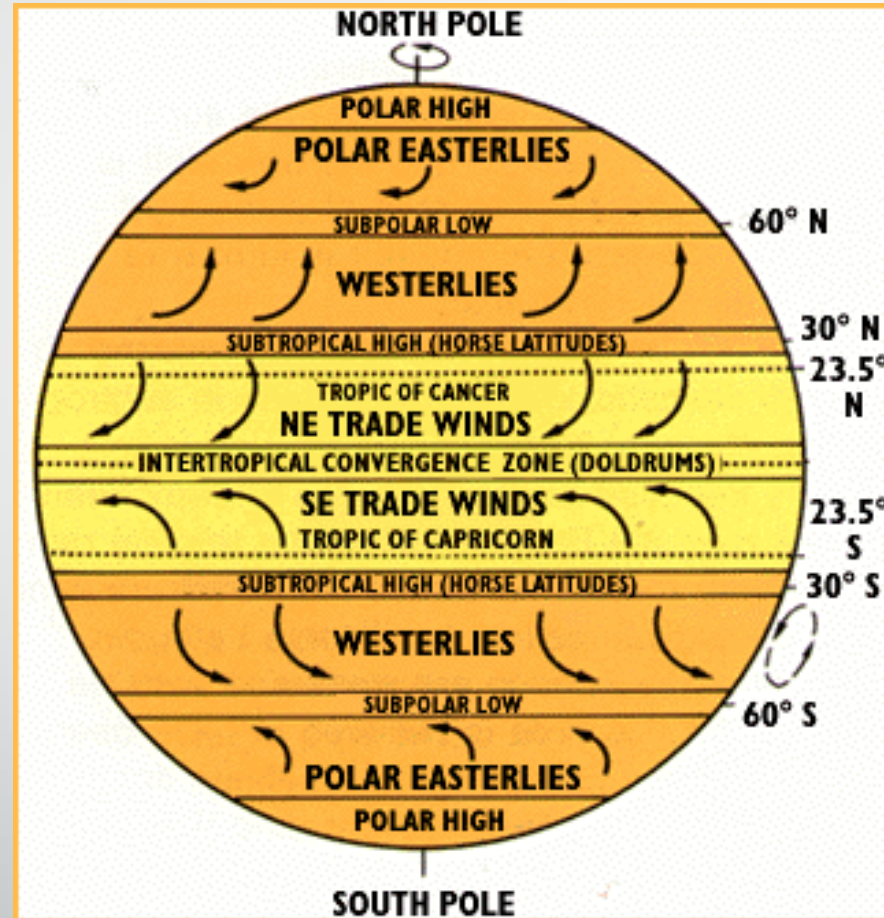
❑ Winds always blow from high pressure areas to low pressure areas.



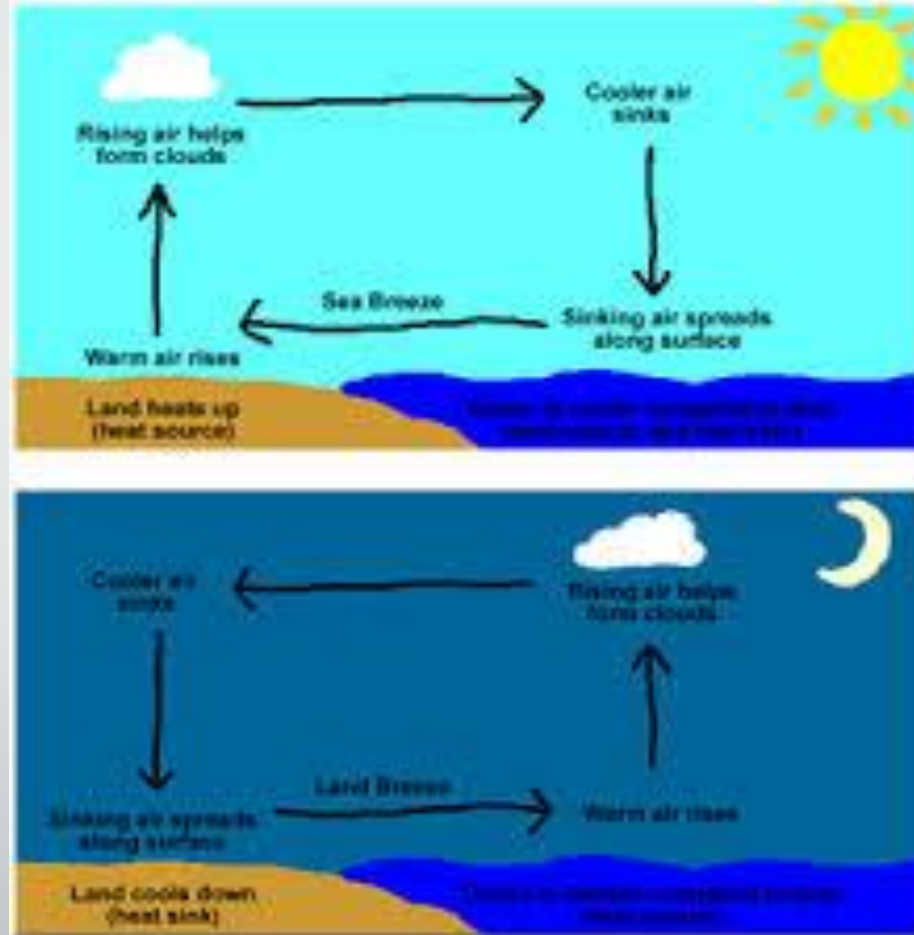
Types of winds

1. **Planetary winds** Also called permanent winds, blow between the pressure belts of the earth.
2. **Local Winds** Winds that blow in a particular area for a particular time, eg. Loo, (northwest India) Chinook (North America)
3. **Periodic winds** Winds that blow during a particular season, eg. Monsoon, land and sea breeze.
4. **Variable winds**. Eg. cyclone and anti cyclone

Planetary Winds

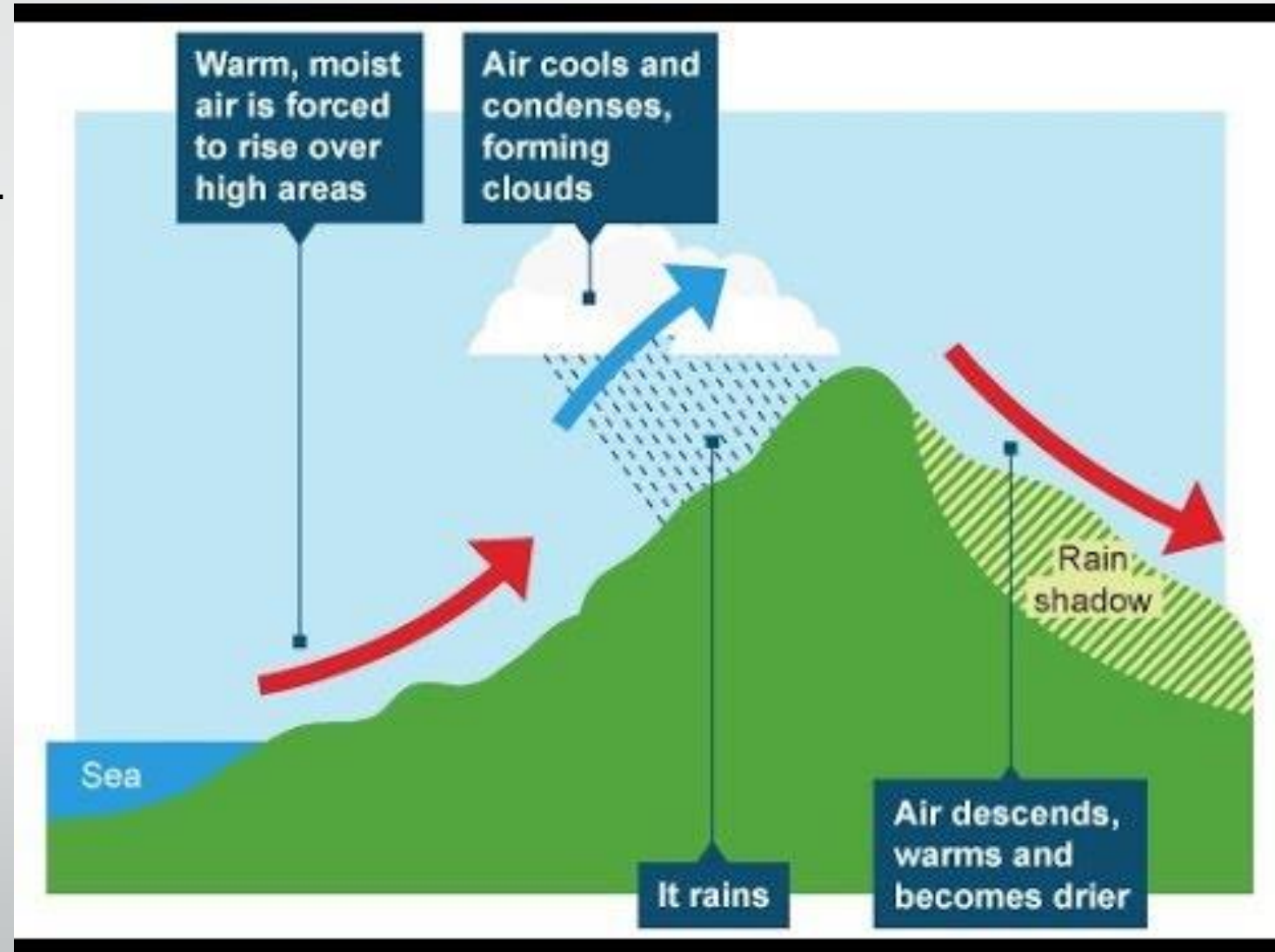


Land and Sea Breeze

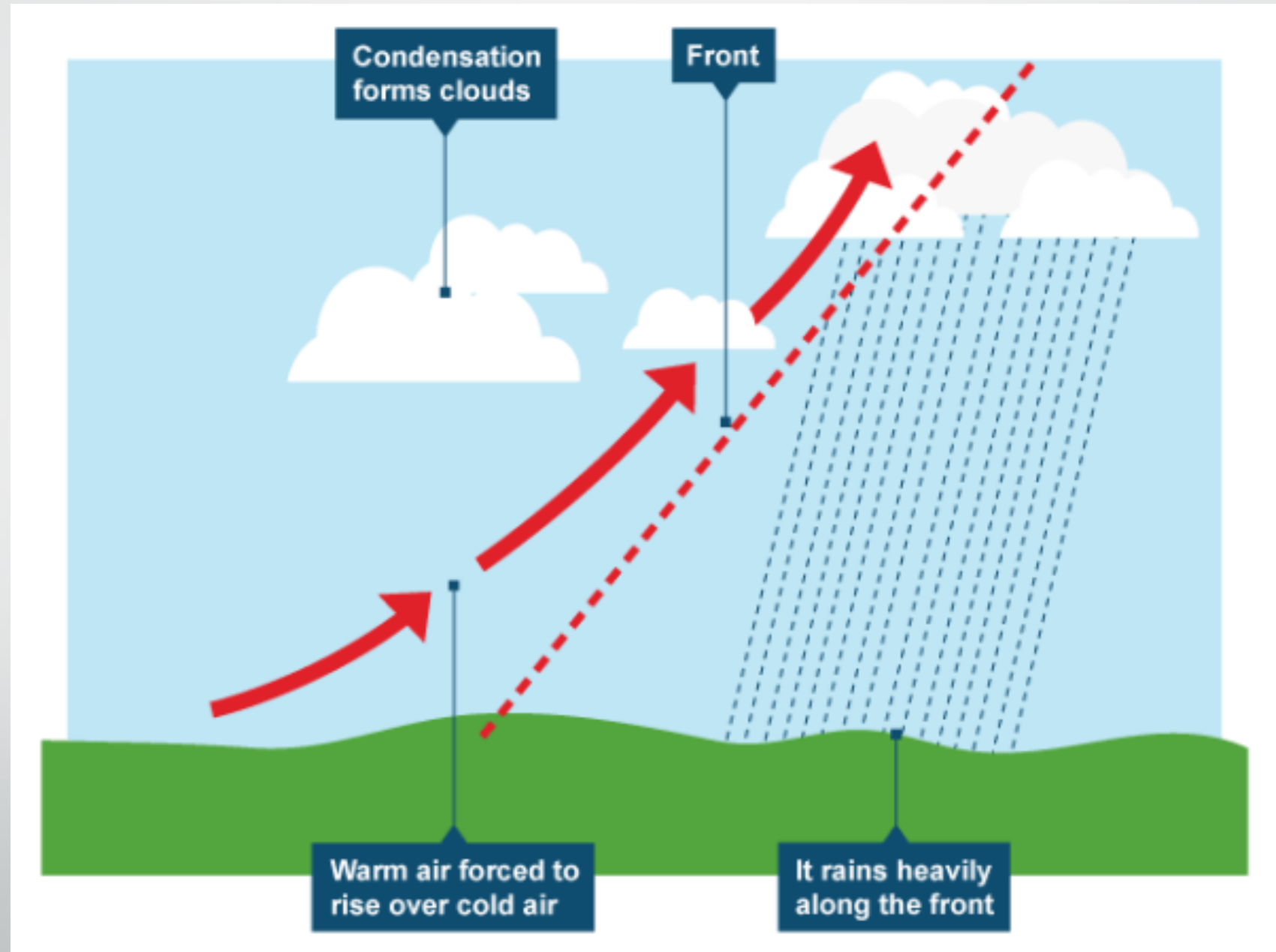


TYPES OF RAINFALL

1. RELIEF RAINFALL



3. CYCLONIC RAINFALL



2. CONVECTIONAL RAINFALL

