

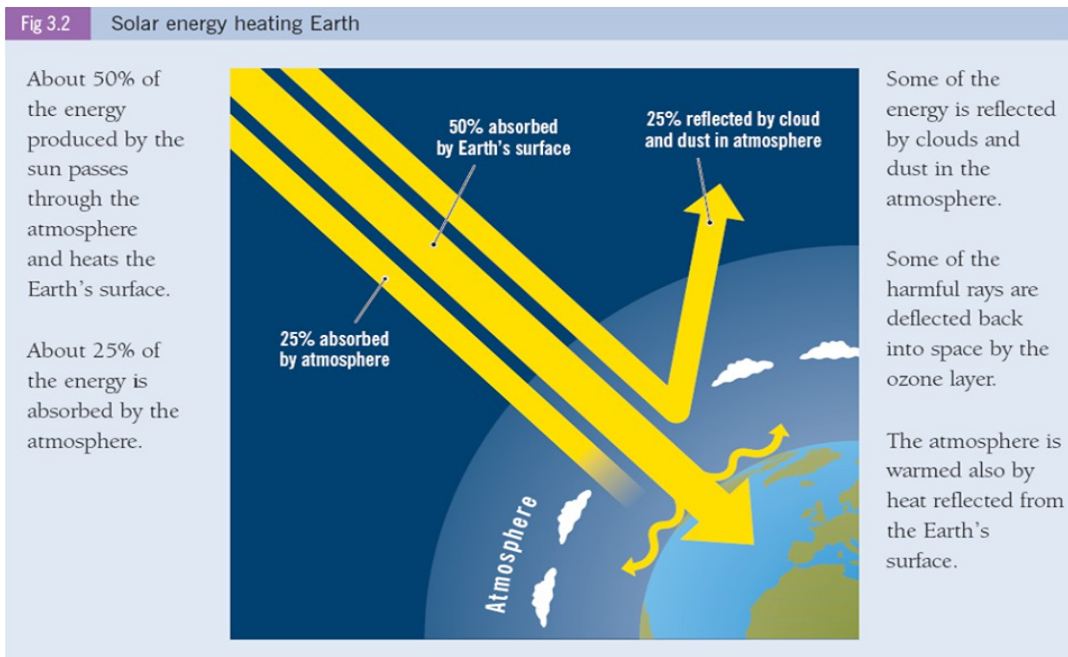
# Sryan Bruen

## The Restless Atmosphere Notes (JC Geography)

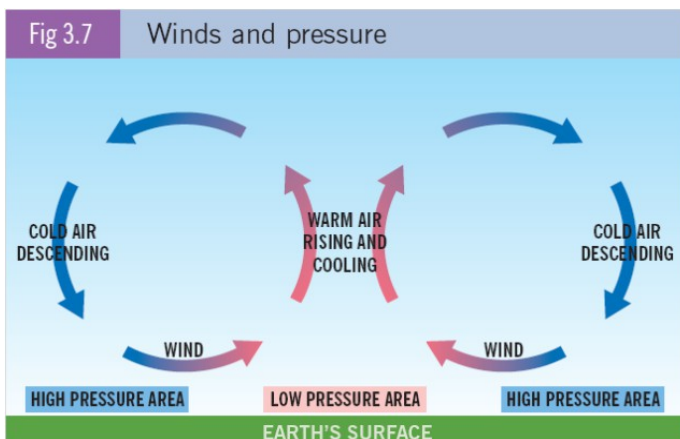
### What is the Atmosphere?

- A blanket of gases surrounding the Earth.
- It is made up of different gases including Nitrogen (78%), Oxygen (21%) and others (1%).
- It is important because it provides the air we need to breathe, absorbs heat from the sun by day, retains heat at night and protects us from harmful rays of the sun.

### Heat Machine



### Atmosphere on the Move



- Pressure in the atmosphere goes in a loop. This means that once it enters a different pressure, it will turn back to the other pressure eventually. As warm air rises, clouds begin to form and cooling takes place. Cold air cannot hold as much moisture so the precipitation falls out of the clouds. The cold air then descends and forms a ridge of high pressure before starting the cycle again.

## Types of Winds

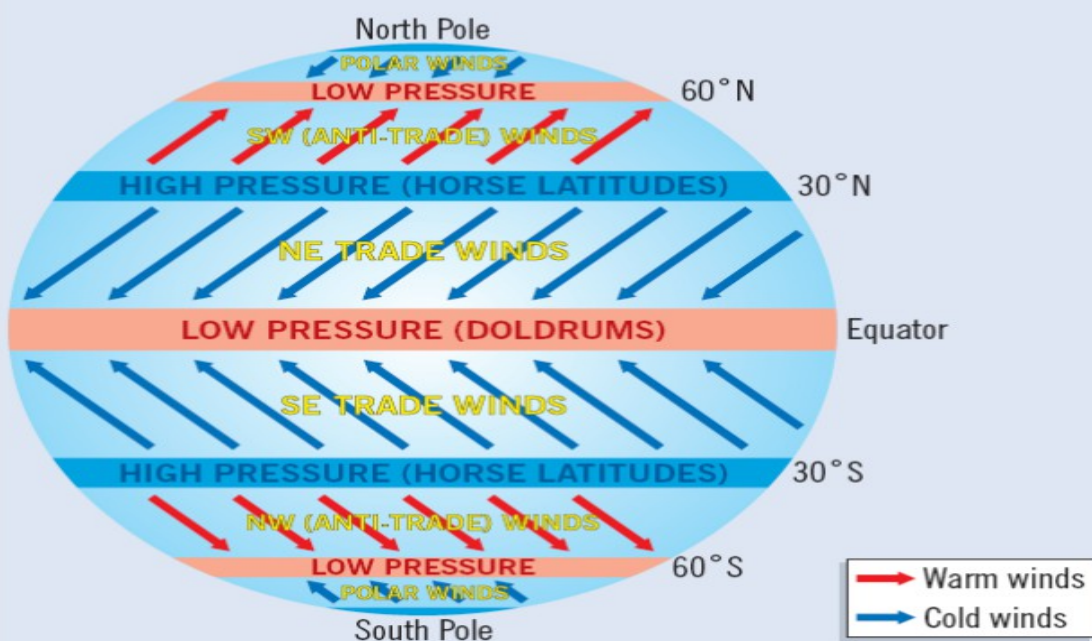
- Winds are named after the direction they are blowing from. For example, the northeasterly winds would come from a northeasterly direction.
- The wind that is most frequent in an area is called the **Prevailing Wind**. Ireland's prevailing wind is a southwesterly direction.

## Coriolis Effect

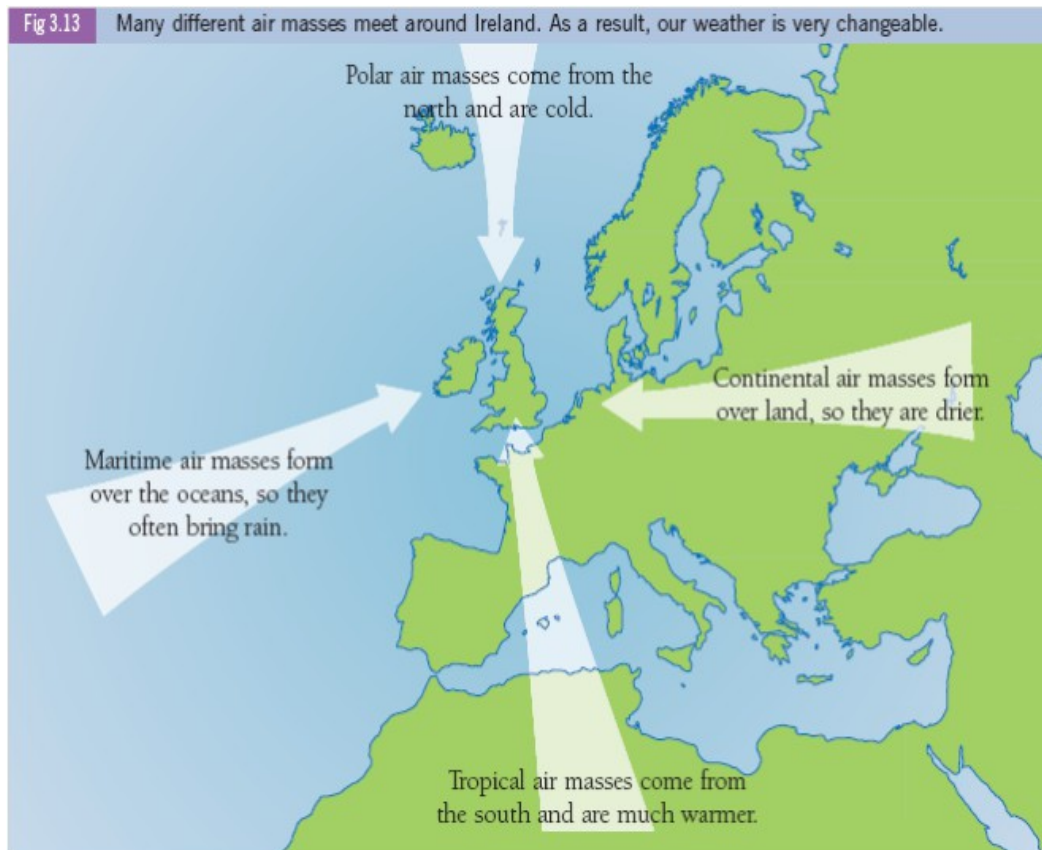
- The Coriolis Effect is the Earth spinning on its axis.
- This is as a result of the winds being deflected at an angle. They are deflected to the right in the Northern Hemisphere and to the left in the Southern Hemisphere.
- **Doldrums** are areas close to the Equator where wind speeds are very low.
- **Trade winds** were named as a result of their ability to quickly drive trading ships across the ocean.

Fig 3.11

Global winds are deflected due to the Coriolis Effect.



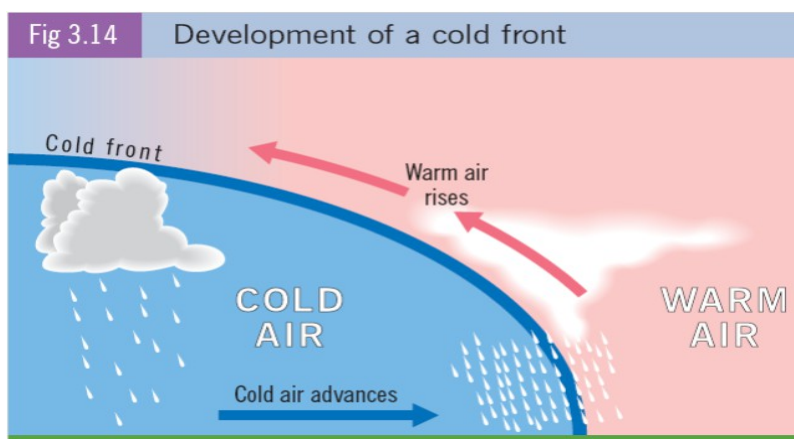
# Air Masses



## Fronts

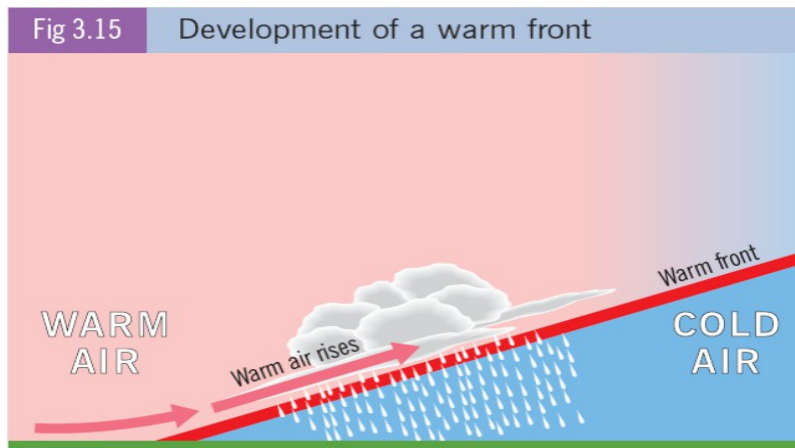
### 1. Cold Front

- A cold front occurs when a cold air mass pushes in and replaces a warm air mass. Warm air mass is lighter so it is forced to rise rapidly into the atmosphere.
- As the warm air rises, it cools and condensation takes place. Masses of cloud develop and heavy rains falls along the front.



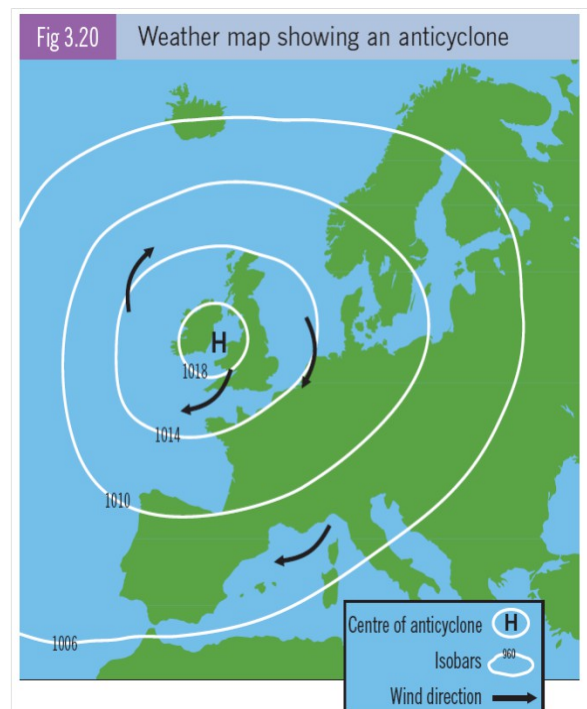
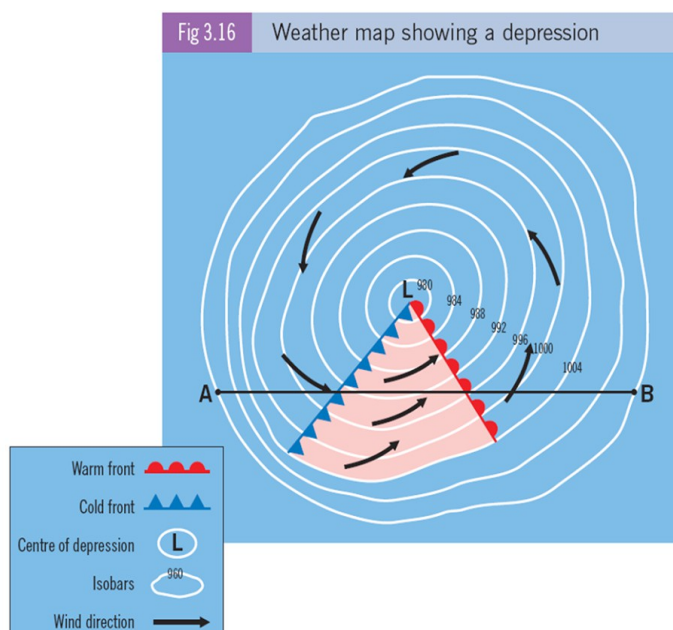
## 2. Warm Front

- A warm front occurs when a warm air mass approaches a cold air mass. The warm air is lighter so it rises up over the cold air.
- As the warm air rises, it cools and condenses to form dark, rain-bearing clouds leaving continuous rain in the process.
- Thunderstorms are normally associated with warm fronts in Summer.



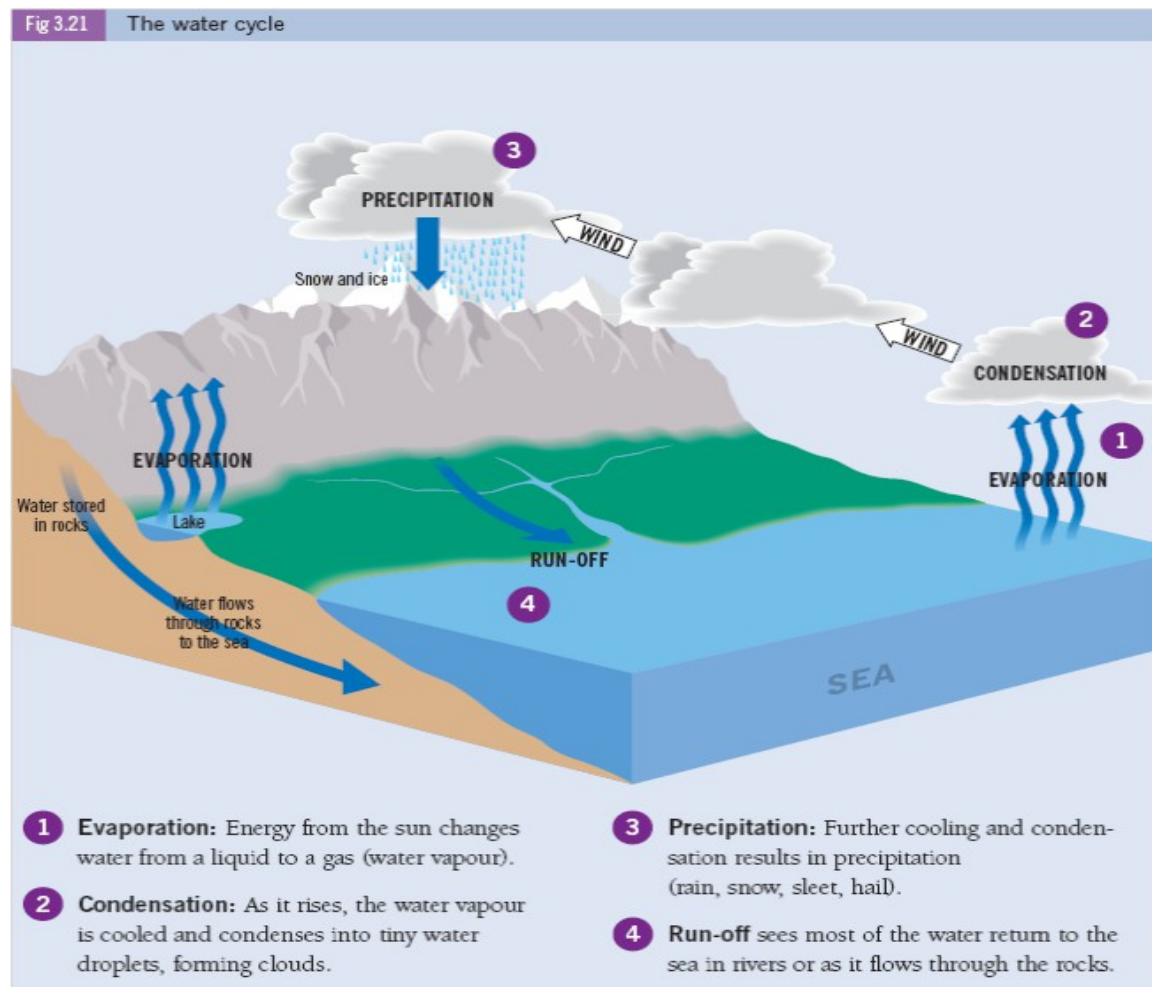
## Depressions and Anticyclones

- A **depression** is an area of low pressure and is associated with unsettled weather.
- An **anticyclone** is an area of high pressure and is associated with settled weather.





# The Water Cycle

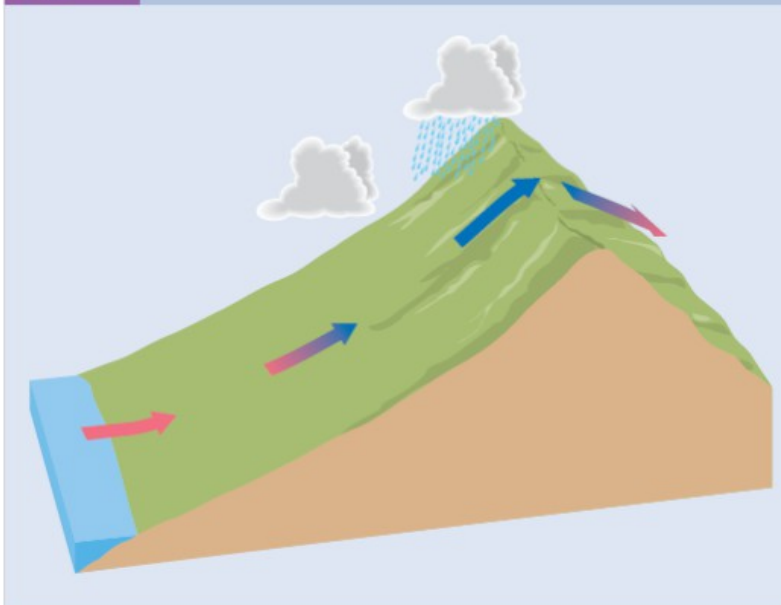


## Precipitation Types

### 1. Relief Rainfall

- A warm wind evaporates water from the sea and blows it to the land. The air is forced to rise when it reaches high ground. As it rises, it cools.
- Condensation forms cloud because the cooled air can't hold as much moisture. The droplets then join and get heavier. Rain then falls on the windward slope.
- On the leeward slope, the air descends and gets warmer. The cloud evaporates so there is very little rain.

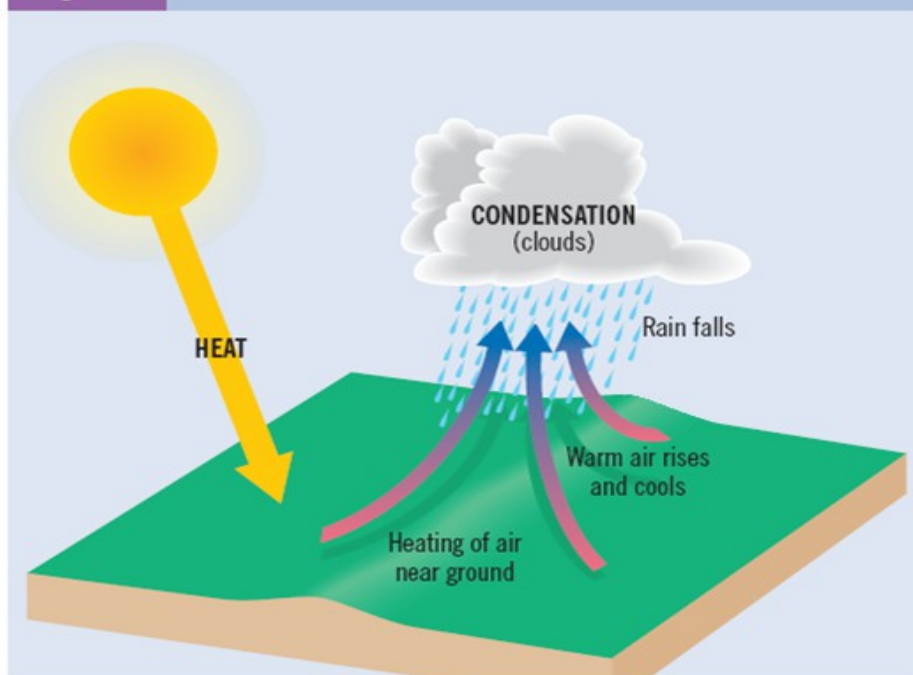
Fig 3.22 Relief rainfall



## 2. Convective Rainfall

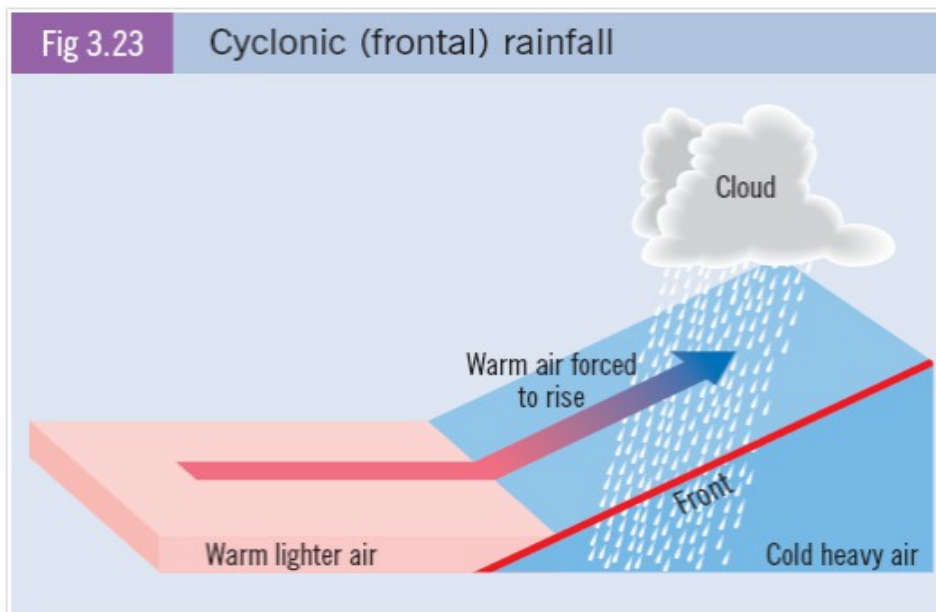
- The sun heats the ground all morning. The air near the ground gets warm and moisture is evaporated.
- By early afternoon, the heated air expands, it becomes lighter and rises. The rising air then cools and condensation takes place forming cumulus clouds.
- The cool air is unable to hold all moisture so the droplets join together and gets heavier then the rain falls.

Fig 3.24 Convective rainfall



### 3. Cyclonic / Frontal Rainfall

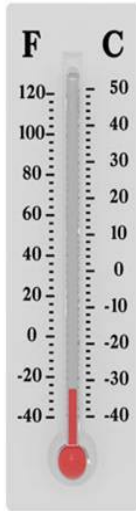
- A warm wind blows towards the cold air. When the warm air reaches the cold air, it rises because it is lighter. As it rises, it cools and condenses forming stratus clouds.
- Due to the cold air being unable to hold as much moisture, the droplets join and get heavier so rain falls.



## Weather

Element	Instrument	Unit of Measurement	Isoline Maps
Temperature	Dry bulb thermometer	°C/Degrees Celsius °F/Degrees Fahrenheit	Isotherms
	Maximum thermometer		
	Minimum thermometer		
Humidity	Hygrometer	Percentages (%)	
Precipitation	Rain gauge	Millimetres (mm)	Isohyets
Sunshine	Campbell-Stokes recorder	Hours (hrs)	Isohels
Wind Speed	Anemometer (Beaufort scale)	Km/hr or mph or knots	Isotachs
Wind Direction	Wind vane	Directions	
Air Pressure	Aneroid barometer	Millibars (mb)/Hectopascals (hPa)	Isobars

# Weather Instruments



**Thermometer**



**Hygrometer**



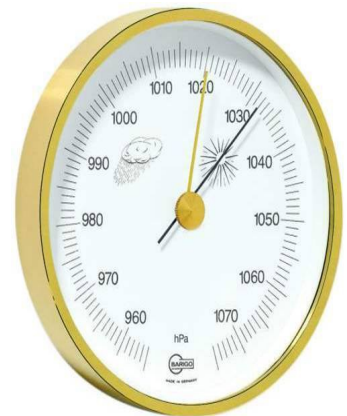
**Rain Gauge**



**Anemometer**



**Wind Vane**



**Barometer**



**Campbell-Stokes Sunshine Recorder**



# Temperature

- **Mean Temperature** = Sum of temperatures  $\div$  number of months/days.
- **Temperature range** = Maximum temperature — Minimum temperature.

## The Greenhouse Effect

- The greenhouse effect is when gases of the atmosphere trap much energy into it and they act like the glass on a greenhouse because they let heat in and prevent most of it getting out.
- Carbon dioxide, methane, chlorofluorocarbons (CFCs) and nitrous oxide are the most effective gases at trapping heat.
- Due to the atmosphere trapping gases like a greenhouse, **global warming** takes place.

## Causes of Global Warming

1. Burning of fossil fuels
2. Deforestation
3. Methane
4. Burning of fuels
5. Chlorofluorocarbons (CFCs)

## Impacts of Global Warming on the World

1. A rise in sea levels
2. Climate change

## Impacts of Global Warming on Ireland

1. Heavier rainfall and downpours
2. Drier, warmer summers
3. More severe storms

## Solutions to Global Warming

1. Clean energy
2. Reduce deforestation
3. Reduce, reuse and recycle
4. Use energy-efficient appliances