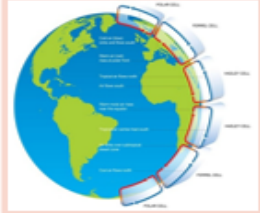


Hazards Knowledge Organiser

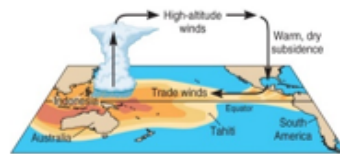
Global pattern of air circulation	
Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.	
Hadley cell	Largest cell which extends from the Equator to between 30° to 40° north & south.
Ferrel cell	Middle cell where air flows poleward between 60° & 70° latitude.
Polar cell	Smallest & weakest cell that occurs from the poles to the Ferrel cell.



Distribution of Droughts
Drought can occur anywhere throughout the world but they are more frequent between the tropics of Cancer and Capricorn. Many countries in Africa suffer from severe drought, such as Ethiopia but Australia also suffer.

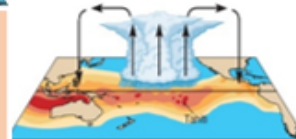
Causes of Drought: El Nino effect

The El Nino effect is also associated with creating dry conditions.



Normally, **warm ocean currents** off the coast of Australia cause **moist warm air** to rise and **condense** causing storms and **rain** over Australia.

In an El Niño year (every 2-7 years) the **cycle reverses**. Cooler water off the coast of Australia reverses the wind direction leading to **dry, sinking air** over Australia causing **hot weather** and a **lack of rainfall**.



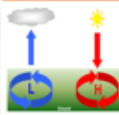
Distribution of Tropical Storms.
They are known by many names, including hurricanes (North America), cyclones (India) and typhoons (Japan and East Asia). They all occur in a band that lies roughly between the tropics of Cancer and Capricorn and despite varying wind speeds are ferocious storms. Some storms can form just outside of the tropics, but generally the distribution of these storms is controlled by the places where sea temperatures rise above 27°C.

Formation of Tropical Storms

- 1 The sun's rays heats large areas of ocean in the summer. This causes warm, moist air to rise over the particular spots
- 2 Once the temperature is 27°, the rising warm moist air leads to a low pressure. This eventually turns into a thunderstorm. This causes air to be sucked in from the trade winds.
- 3 With trade winds blowing in the opposite direction and the rotation of earth involved (Coriolis effect), the thunderstorm will eventually start to spin.
- 4 When the storm begins to spin faster than 74mph, a tropical storm (such as a hurricane) is officially born.
- 5 With the tropical storm growing in power, more cool air sinks in the centre of the storm, creating calm, clear condition called the eye of the storm.
- 6 When the tropical storm hit land, it loses its energy source (the warm ocean) and it begins to lose strength. Eventually it will 'blow itself out'.

Climate Zones	
The global circulation system controls temperatures by influencing precipitation and the prevailing winds. This creates distinctive climate zones.	
Temperate Climate	Mid-latitude, 50° - 60° north & south of the Equator. Here air rises and cools to form clouds and therefore frequent rainfall. e.g. UK.
Tropical Climate	Found along the Equatorial belt, this zones experiences heavy rainfall and thunderstorms. E.g. Brazil.
Polar Climate	Within the polar zones cold air sinks causing dry, icy and strong winds. E.g. Antarctica.
Desert Climate	30° north and south of the equator, sinking dry air leads to high temperatures without conditions for rainfall. E.g. Libya.

High and Low Pressure	
High Pressure	Low Pressure
Caused by cold air sinking. Causes clear and calm weather	Caused by hot air rising. Causes stormy, cloudy weather.

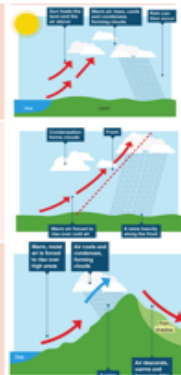


What is wind?

Wind is the movement of air from an area of high pressure to one of low pressure.

Types of wind	
Katabatic Winds	Winds that carry air from the high ground down a slope due to gravity. e.g. Antarctic.
Trade Winds	Wind that blow from high pressure belts to low pressure belts.
Jet Streams	These are winds that are high in the atmosphere travelling at speeds of 225km/h.

Types of precipitation	
Convictional Rainfall	When the land warms up, it heats the air enough to expand and rise. As the air rises it cools and condenses. If this process continues then rain will fall.
Frontal Rainfall	When warm air meets cool air an front is formed. As the warm air rises over the cool air, clouds are produced. Eventually steady rain is produced.
Relief Rainfall	When wind meets mountains, the warm air is forced to rise quickly and cool. This leads condensation and eventually rainfall. When the air descend however, little very rainfall falls, creating a rain shadow.



Topic 1 Global Hazards

Extremes in weather conditions

Wellington, New Zealand Very high wind speeds (248mkm/h) due to the surrounding mountains funnelling wind.	Puerto Lopez Found along the equator, high temperatures lead to rapid condensation and heavy rainfall.
The Atacama, Chile The Andes mountains block moist warm travelling any further west. This causes rainfall to the east, but a rain shallow to the west.	Mawsynram, India This village see a lot of rain each year (11m per yr.). This is due to the reversal of air conditions/directions from sea to land. In the summer, this contributes to monsoons.

Changing pattern of these Hazards

Tropical Storms	Scientist believe that global warming is having an impact on the frequency and strength of tropical storms. This may be due to an increase in ocean temperatures.
Droughts	The severity of droughts have increase since the 1940s. This may be due to changing rainfall and evaporation patterns related to gradual climate change.

Case Study: UK Heat Wave 2003

Causes

The heat wave was caused by an anticyclone (areas of high pressure) that stayed in the area for most of August. This blocked any low pressure systems that normally brings cooler and rainier conditions.

Effects	Management
<ul style="list-style-type: none"> • People suffered from heat strokes and dehydration. • 2000 people died from causes linked to heatwave. • Rail network disrupted and crop yields were low. 	<ul style="list-style-type: none"> • The NHS and media gave guidance to the public. • Limitations placed on water use (hose pipe ban). • Speed limits imposed on trains and government created 'heatwave plan'.

Case Study: Typhoon Haiyan 2013

Causes

Started as a tropical depression on 2nd November 2013 and gained strength. Became a Category 5 "super typhoon".

Effects	Management
<ul style="list-style-type: none"> • Almost 4,000 deaths. • 130,000 homes destroyed • Water and sewerage systems destroyed caused diseases. • Emotional grief for lost ones. 	<ul style="list-style-type: none"> • The UN raised £190m in aid. • USA & UK sent helicopter carrier ships deliver aid remote areas. • Education on typhoon preparedness.

