

9-1 GCSE OCR B Geography Knowledge Organisers

1. Global Hazards
2. UK in the 21st Century
3. Distinctive Landscapes
4. Changing Climate
5. Dynamic Development
6. Resource Reliance
7. Sustaining Ecosystems
8. Urban Futures



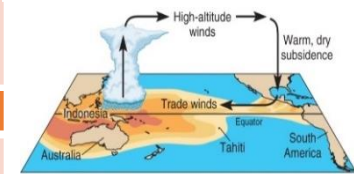
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Global pattern of air circulation	
Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.	
Hadley cell	Largest cell which extends from the Equator to between 30° to 40° north & south.
Ferrel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

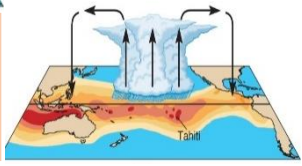


Distribution of Droughts
Drought can occur anywhere throughout the world but they are more frequent between the tropics of Cancer and Capricorn. Many countries in Africa suffer from severe drought, such as Ethiopia but Australia also suffer.
Causes of Drought: El Nino and La Nina effect

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**.

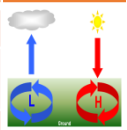


Climate Zones	
The global circulation system controls temperatures by influencing precipitation and the prevailing winds. This creates distinctive climate zones.	
Temperate Climate	Mid-latitude, 50° - 60° north & south of the Equator. Here air rises and cools to form clouds and therefore frequent rainfall. 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 airs leads to high temperatures without conditions for rainfall. E.g. Libya.

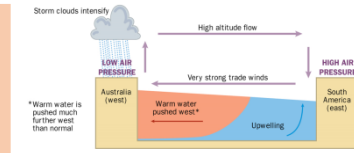
Topic 1 Global Hazards

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.



A La Niña event may, but does not always, follow an El Niño event. Unusually **cold sea surface temperatures (3-5°C colder)** found in the **eastern tropical Pacific**. Impacts of La Niña are the **opposite** of El Niño, where **Australia** would experience droughts during El Niño, there could be an **increased risk of flooding** during La Niña.



Likewise, **Peru** could experience **droughts** during La Niña. Could be described as a **more exaggerated version of a normal year** in the Pacific Ocean.

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.

Extremes in weather conditions	
Wellington, New Zealand	Puerto Lopez
Very high wind speeds (248km/h) due to the surrounding mountains funnelling wind.	Found along the equator, high temperatures lead to rapid condensation and heavy rainfall.
The Atacama, Chile	Mawsynram, India
The Andes mountains block moist warm travelling any further west. This causes rainfall to the east, but a rain shallow to the west.	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.

What is precipitation?
This is when water vapour is carried by warm air that rises. As it gets higher, the air cools and the water vapour condenses to form a cloud. As water molecule collide and become heavier, the water will fall to Earth as precipitation.

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 heats large areas of ocean in the summer and autumn. 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'.

Case Study: UK Heat Wave 2015	
Causes	
The heat wave was caused by an anticyclone (areas of high pressure) that stayed in the area in July. This blocked any low pressure systems that normally brings cooler and rainier conditions.,	

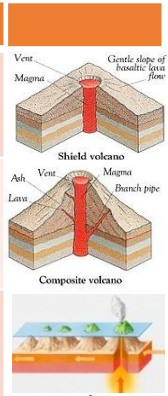
Effects	Management
<ul style="list-style-type: none"> People suffered from heat strokes and dehydration. Fires due to lightning strikes. Rail network disrupted Sports days cancelled 	<ul style="list-style-type: none"> The NHS and media gave guidance to the public. Train speed limits imposed Government implemented 'level 3 heatwave action'. Warning about open water swimming

Case Study: Typhoon Haiyan 2013	
Causes	
Started as a tropical depression on 2 nd November 2013 and gained strength. Became a Category 5 "super typhoon".	

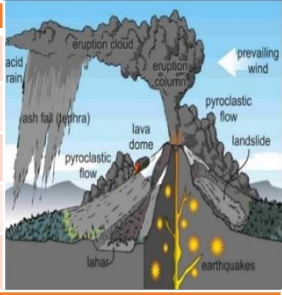
Effects	Management
<ul style="list-style-type: none"> Almost 4,000 deaths. 130,000 homes destroyed Water and sewerage systems destroyed caused diseases. Emotional grief for lost ones. 	<ul style="list-style-type: none"> The UN raised £190m in aid. USA & UK sent helicopter carrier ships deliver aid remote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

The structure of the Earth	
The Crust	Varies in thickness (5-10km beneath the ocean. Made up of several large plates.
The Mantle	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state that is in a state of convection.
The Inner and outer Core	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.

Types of volcanoes	
Shield	Made of basaltic rock and form gently sloping cones from layers of runny lava. Location: hot spots and constructive margins. Eruptions: gentle and predictable
Composite	Most common type found on land. Created by layers of ash and lava. Location: Destructive margins Eruptions: explosive and unpredictable due to the build of pressure within the magma chamber.
Hotspots	These happen away from any plate boundaries. They occur because a plume of magma rises to eat into the plate above. Where lava breaks through to the surface, active volcanoes can occur above the hot spot. E.g. Hawaii.




Volcanic Hazards	
Ash cloud	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
Gas	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
Lahar	A volcanic mudflow which usually runs down a valley side on the volcano.
Pyroclastic flow	A fast moving current of super-heated gas and ash (1000°C). They travel at 450mph.
Volcanic bomb	A thick (viscous) lava fragment that is ejected from the volcano.



Convection Currents	
The Lithosphere is divided into tectonic plates which are moving due to convection currents in the asthenosphere.	
1	Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
2	When lower parts asthenosphere heat up they become less dense and slowly rise .
3	As they move towards the top they cool down, become more dense and slowly sink .
4	These circular movements of semi-molten rock are convection currents
5	Convection currents create drag on the base of the tectonic plates and this causes them to move.

Case Study: Eyjafjallajökull Eruption, Iceland 2010



Causes

- The North-American and Eurasian plates move apart- called constructive plates.
- The disruption caused by Eyjafjallajökull was the result of a series of small volcanic eruptions, starting on the 20th March and ending in the October.

Effects

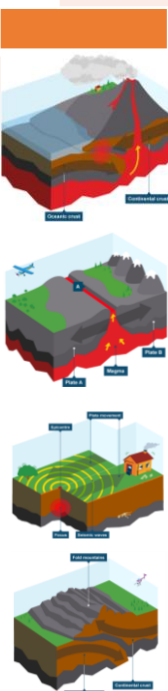
The thick ice cap melted which caused major flooding.
No reported deaths.
Airspace closed across Europe, with at least **17,000 flights cancelled**
Costed insurers **£65million** to customers with cancelled flights.

Management

Iceland had a good warning system with texts being sent to residents with a 30 minute warning.
Large sections of European airspace were closed down due ash spreading over the continent.
Airlines developed ash monitoring equipment

Managing Volcanic Eruptions	
Warning signs	Monitoring techniques
Small earthquakes are caused as magma rises up.	Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.	Thermal imaging and satellite cameras can be used to detect heat around a volcano.
When a volcano is close to erupting it starts to release gases.	Gas samples may be taken and chemical sensors used to measure sulphur levels.
Preparation	
Creating an exclusion zone around the volcano.	Being ready and able to evacuate residents.
Having an emergency supply of basic provisions, such as food	Trained emergency services and a good communication system.

Types of Plate Margins	
Destructive Plate Margin	When the denser plate subducts beneath the other, friction causes it to melt and become molten magma. The magma forces its way up to the surface to form a volcano. This margin is also responsible for devastating earthquakes.
Constructive Plate Margin	Here two plates are moving apart causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the Mid Atlantic Ridge.
Conservative Plate Margin	A conservative plate boundary occurs where plates slide past each other in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones that happening along the San Andreas Fault, USA.
Collision Zones	Collision zones form when two continental plates collide. Neither plate is forced under the other, and so both are forced up and form fold mountains. These zones are responsible for shallow earthquakes in the Himalayas.



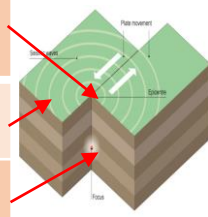
Causes of Earthquakes

Earthquakes are caused when two plates become **locked** causing **friction** to build up. From this **stress**, the **pressure** will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of **seismic waves**, to travel from the **focus** towards and the **epicentre**. As a result, the crust vibrates triggering an earthquake.

The point directly above the focus, where the seismic waves reach first, is called the **EPICENTRE**.

SEISMIC WAVES (energy waves) travel out from the focus.

The point at which pressure is released is called the **FOCUS**.



Earthquake Management

PREDICTING


Methods include:

- Satellite surveying (tracks changes in the earth's surface)
- Laser reflector (surveys movement across fault lines)
- Radon gas sensor (radon gas is released when plates move so this finds that)
- Seismometer
- Water table level (water levels fluctuate before an earthquake).
- Scientists also use seismic records to predict when the next event will occur.

PROTECTION

You can't stop earthquakes, so earthquake-prone regions follow these three methods to reduce potential damage:

- Building earthquake-resistant buildings
- Raising public awareness
- Improving earthquake prediction



How do we measure earthquakes?

Mercalli Scale	Richter Scale
<ul style="list-style-type: none"> Measures how much damage is caused, based on observations, not scientific instruments. Base from 'Instrument' and 'Weak' to 'Extreme' and 'Cataclysmic'. Limitations is that its subjective due to it being based on perception. 	<ul style="list-style-type: none"> Is a scientific measurement based on the energy released. Measured by seismometers using measurement from 1 – 10 Logarithmic – each point up the scale is 10 times greater than the one before.

Earthquake proof buildings ideas

1. Counter-weights to the roof to help balance any swaying.	2. Roof made from reinforced cement concrete.
3. Foundations made from reinforced steel pillars, ball-bearings or rubber.	4. Windows fitted with shatter-proof glass to reduce breakage.
5. Lightweight materials that cause minimal damage if fallen during an earthquake.	6. Ensure gas pipes have an automatic shut off to prevent risk of fire.

UK Physical Characteristics

- Most mountains are located in the **north and west**, such as Wales and Scotland.
- These areas have **few roads and settlements** but beautiful scenery. – Sparsely populated.
- South and east** of the UK is **flat** with a few hilly areas.
- These areas are suited for **settlements, roads and railways** – Densely populated.
- Rivers flow from mountainous areas down to the sea.



UK Rainfall Patterns

- Highest rainfall is in the north and west** where average rainfall is **2500mm**.
- Lowest rainfall is in the south and east** with average rainfall of **500 – 625mm**.



UK Relief Rainfall

Most UK rainfall is caused by **prevailing wind** blowing from the southwest.

When air carrying moisture reaches upland areas, it is **forced up** to produce **relief rainfall**.

The other side of the upland area has **little moisture**, this is called the **rain shadow**.



Water stress in the UK

Water stress is when areas have limited water supply.

Problems

- Most rainfall occurs in **North & West** but least rainfall in **South & East**.
- South & East UK therefore have **High demands**.
- Demands involve domestic, industrial & agricultural uses.

Solutions

- Water can be **transferred** from the wetter west to drier east by **pipelines** or rivers.
- Construct **new reservoirs** in the east to capture/store more water.
- Greater **water conservation**.

Land use in the UK

Land use varies throughout the UK. However our land is always changing. Nonetheless, the vast majority of the UK is farmland.



UK mountain areas (Scotland) have rough pastures and moorlands. The climate is harsh and soil is poor for crops

Arable farmland dominates because of the warm, sunny and dry climate. Crops such as cereals and vegetables are found in the South and East.

Coniferous woodland are found in northern England, Wales and Scotland. There areas have poor soils and are remote.

Grasslands are found in the west. It is ideal for cattle and sheep because of the mild and wet climate.

Grasses	52%
Arable	20%
Urban	14%
Forest	12%
Water	1%
Other	1%

Urban areas are growing. This outward growth or sprawling urban developments is caused by population growth.

Topic 7

UK in the 21st Century



Population in the UK

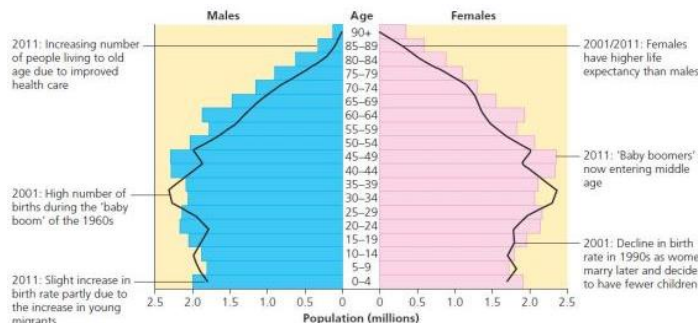
The UK population is 65 million and still rising. It is predicted to reach 70 million by 2030.

Reasons for growth

Natural increase – the difference between deaths and births.
Net migration – the difference between immigration to the UK and emigration from the UK.
Life expectancy – the average age someone will live up to.

Future of growth

The UK's **population pyramid** shows that the country's birth rate is fairly low and death rate is also low meaning there are more elderly people.
Population pyramids are useful to help plan for the future.



UK Population Distribution

Low

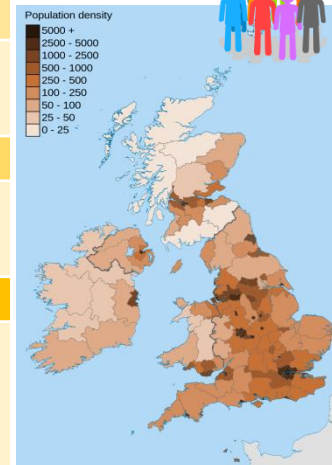
Much of Northern Scotland is **sparse** due to a **mountainous landscape** and **difficult climate**.

High

Rest of the UK because of the **gentle hills, moderate climate** and **good transport routes**.

Very High

Population is **concentrated** around the South East of England, in cities such as London, due to attractions of **employment, shops and entertainment**.



Factors affecting population density

Moderate climate.	Remote and poor communications.	Opportunities for work
A presence of raw materials.	Steep and mountainous.	Fertile and suitable for farming.
Poor quality of soil.	Plentiful supplies of water.	Flat land for farming.

UK Housing Shortage

Problem and Reasons

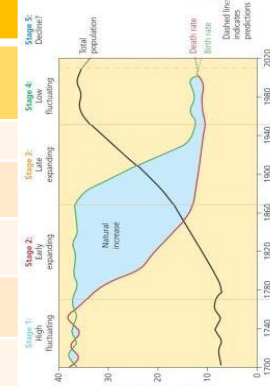
- The UK **population is rising** and therefore **more houses are needed**.
- UK needs to build **240,000 homes a year**, but only half that are built.
- As a result, **house prices are rising** and becoming too expensive.
- Planning permission for new houses leads to **local opposition**.
- Green belt areas** prevents urban areas becoming bigger.
- The **price of lands keeps rising** due to demand.



Demographic Transition Model (DTM)

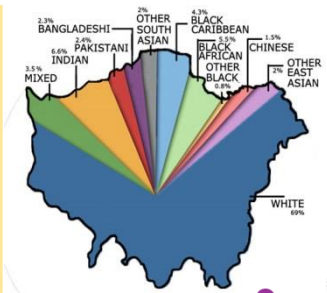
As countries experience economic development they also go through **stages** of population transition. The DTM describes this change and shows the UK in stage 4.

- Birth rates high and death rates fluctuates.
- Birth rate high but death rate is falling rapidly. Natural change increases.
- Birth rate and death rate falling rapidly. Natural change is rapid.
- Birth rate and death rate is low and fluctuating. Little Natural changes.
- Birth rate is falling and death rate is rising slightly. Natural change falls.



Ethnic Diversity in the UK

- 13% of the population in the UK were born in another country.
- In London, this value is about 37%. This has increased between 2001 and the present day.
- The change was driven by an increase in white non-British, Black African and Asian people.



UK Ageing Population



Distribution of Ageing Population

Around 18% of the population are over 65. The distribution of older people is high in coastal areas, especially in east and south-west England. However, it is lower in Northern Ireland and Scotland and generally in big cities.

Causes
<ul style="list-style-type: none"> Large number of people were born after the WW2 and are now moving into old age – Baby boomers. Improved healthcare and new treatments to prolong life. Greater awareness of the benefits of a good diet and exercise.
Effects
<ul style="list-style-type: none"> Healthcare cost are very high and will increase with an increasing ageing population. Shortage of places in care homes, many of which are becoming increasingly expensive. Many older people join clubs and spend on travel therefore helping to boost the economy – the grey pound.
Response
<ul style="list-style-type: none"> Government pension bonds to encourage older people to save money for the future. Pensioners receive support in care, transport and heating allowance to make life more comfortable. Allowing more immigration will provide the demand needed of a younger workforce needed for the economy.

UK's Changing Economy



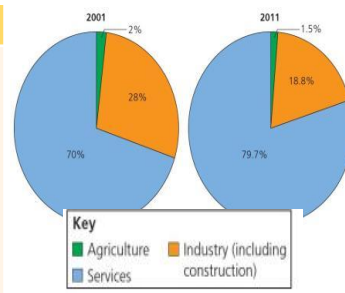
- UK has one of the largest economies in the world.
- The last few decades, heavy manufacturing industries have declined due to competition from abroad.
- Now the UK is moving into the service industry such as finances, technology and media.

Political Changes
<ul style="list-style-type: none"> Between 1997-2007, the UK economy grew strongly & unemployment decreased. This was due to increase investment in education & technology. In 2008 the UK entered a recession and unemployment increased. Recession ended in 2009, creating a strong focus for decreasing the national debt occurred in 2010 elections.

UK Employment Sector

Key changes since 2001

- The quaternary industry has increased, whilst secondary has decreased.
- Number of people employed in primary and tertiary industry has stayed the steady.
- Big increase in professional and technical jobs.
- Employment in manufacturing has decreased the most due to cheap labour abroad.



Case Study - Changes in Merthyr Tydfil, South Wales

UK Working Hours



- In 2011 the average number of hours worked in the UK was 42.7.
- This figure is the 3rd highest figure within the EU.
- Fathers now work fewer hours to look after children.
- Number of mothers in fulltime work has increased.

UK's Core Economic Hubs

An economic hub is a central point or area associated with economic success and innovation. Many of these economic hubs are located near universities. Below is a selection of economic hubs throughout the UK.

Belfast Titanic Quarter
Film studio, offices and education based on the old shipyard.

Salford
Media industry including BBC and ITV.
Manufacturing of chemicals.

Bristol
Creative and digital industries. Key services such as law and finance.



Aberdeen
Centre for the North Sea oil and gas industry, now developing as a research and development hub.

Silicon Glen
High-tech industries based in key Scottish cities. They focus on electronics and software.

Silicon Fen
High tech research hubs associated with Cambridge University.

Case Study: UK Economic Hub – Cambridge

Cambridge is one of the UK's education hotspots – with a world class university and being a science city. It now has fourteen billion-dollar companies and continues to expand.

Significance of Cambridge to the UK	Advantages and Disadvantages
<ul style="list-style-type: none"> World leading University of Cambridge. Income 34% higher than national average. Cambridge makes a net contribution to the UK economy. 4,000 knowledge-intensive companies. 	<ul style="list-style-type: none"> Leading university means a highly skilled workforce. Located on main routes to London, Birmingham etc. – e.g. M11, A1. Science Park means large TNC's (health companies for example) want their businesses here. However, a lot of university students move out of Cambridge due to high rental costs.

The UK's Role in the World

The UK may be a small island state, but it does play a significant role in the wider world. It is also part of several key international organisations.

NATO	UN	G7
A group of 28 countries who work militarily and politically to resolve conflict as a last resort.	Is made up of 193 member states with the aim of maintaining peace and resolving issues. UK is part of the Security Council.	Involves seven of the wealthiest western countries to discuss relevant issues and come to economic agreements.

Case Study: The UK's role in the Middle East

Basic Background

The UK has a long history within the Middle East with parts of it controlled by the British Empire (such as Palestine) & as a decision maker in how countries & their borders came to exist. The region is very important in trading for its valuable imports of oil & gas with exports from the UK in military hardware.



UK Involvement

- Recently the UK has been involved as part of NATO in invading Iraq (2003) & currently, since 2015, supporting military action in Syria. The UK is also part of ongoing training & peace keeping activities within the region.

UK Media Exports

- The UK exports many different types of media products such as films, TV and music and books.
- Exporting media is key to the UK economy as it employs 1.7 million people and generates £17 billion.
- Example: Harry Potter sold 400 million copies to 200 territories.

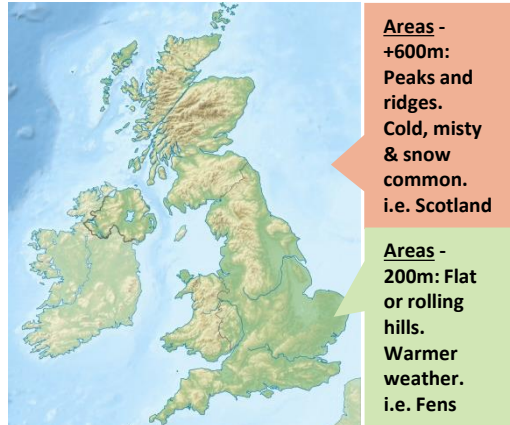
UK's Media's influences
<ul style="list-style-type: none"> Most exports are in English, meaning it develops other's understanding of our language. Many people around the world copy fashion & styles seen in UK media. Can attract people to visit the UK.

Multicultural UK

The UK is a multicultural country due to many ethnic minorities moving here from India, Pakistan, Caribbean and parts of Africa. These groups have shared their culture and have influenced the UK in many ways.

Fashion	Media	Food
<ul style="list-style-type: none"> Many shops sell traditional clothing. As these traditional clothing become more common, other cultures have started to wear them too. i.e. Saris Hair styles from other cultures such as dreadlocks from the Jamaica. 	<ul style="list-style-type: none"> Many ethnic minorities have influenced music (i.e. dubstep) and television (i.e. Bollywood). With greater influence, greater understanding from other ethnic groups have been established. 	<ul style="list-style-type: none"> Food that has originated from other countries have become very established (i.e. Curry and Pizza). Many mainstream supermarkets sell a great range of ingredients and ready made foods from other cultures.

What is a landscape?		Relief of the UK	
A landscape has visible features that make up the surface of the land. Landscapes can be broken down into four 'elements'.		Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.	
Landscape Elements			
Physical		Biological	
<ul style="list-style-type: none"> Mountains Coastlines Rivers 	<ul style="list-style-type: none"> Vegetation Habitats Wildlife 		
Human		Variable	
<ul style="list-style-type: none"> Buildings Infrastructure Structures 	<ul style="list-style-type: none"> Weather Smells Sounds/Sights 		
		Key	
		Lowlands	
		Uplands	

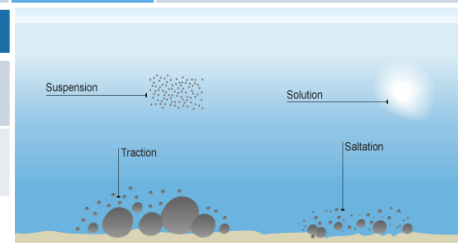


Erosion	
The break down of rocks – smooth, round and sorted.	
Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolved rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

Transportation	
A natural process by which eroded material is carried/transported.	
Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

Glaciation in the UK	
Over many thousands of years, glaciation has made an impression on the UK's landscape. Today, much of upland Britain is covered in u-shaped valleys and eroded steep mountain peaks.	
During the ice age	
Ice covered areas eroded and weathered landscapes to create dramatic mountain scenery.	
After the ice age	
Deep valleys and deposition of sediment revealed	

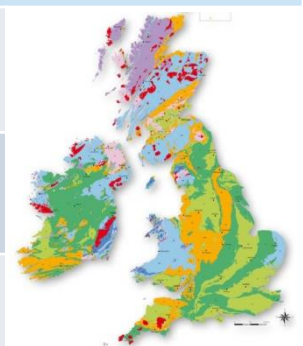
Human activity on Landscape		
Farming has changed the vegetation which grows there.	Much of the rural landscape has been replaced by urban sprawls.	Infrastructure such as roads and pylons cover most of the UK.
Over thousands of years, much of the UK's woodlands have gone.	Increasing population of the UK means more houses are needed.	UK's marshes and moorlands are heavily managed by people.



Geology of the UK

The UK is made from a variation of different rock types. The varied resistance of these rocks influences the landscape above.

- Igneous Rock**
Volcanic/molten rock brought up to the Earth's surface and cooled into solid rock.
- Sedimentary Rock**
Made from broken fragments of rock worn down by weathering on Earth's surface.
- Metamorphic Rock**
Rock that is folded and distorted by heat and pressure.



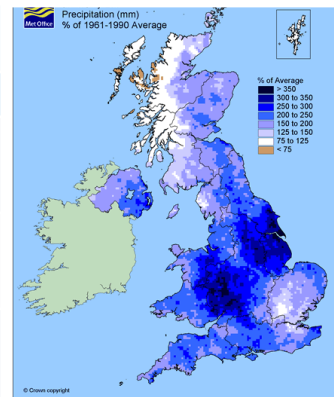
Topic 3 Distinctive Landscapes

Climate and Weather in the UK

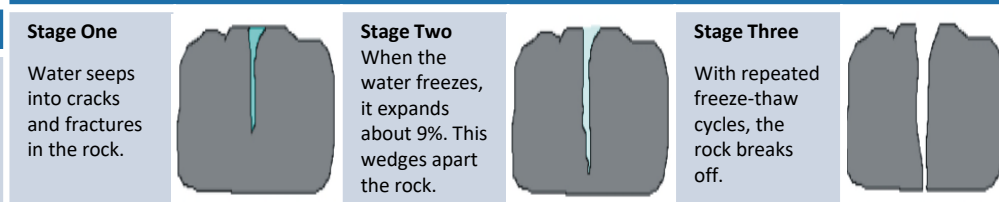
The variations of climate and weather means there are different influences on the UK's landscape.

Climate	Weathering
<p>The rainfall map of the UK shows variations in average rain.</p> <ul style="list-style-type: none"> Less precipitation occurs in low land areas. East England Most precipitation occurs in upland areas. Scotland. <p>These differences mean... Uplands experience more weathering, erosion and mass movement.</p>	<p>Mechanical Caused by the physical action of rain, frost and wind.</p> <p>Chemical Action of chemicals within rain dissolving the rock.</p> <p>Biological Rocks that have been broken down by living organisms.</p>

Average rainfall in the UK



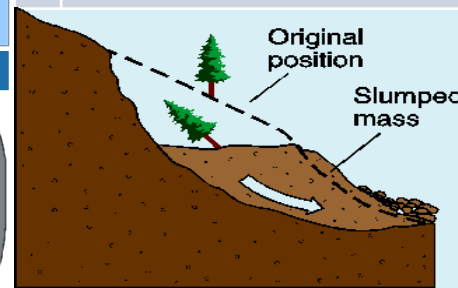
Freeze-thaw weathering



Mass Movement

A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.

- Rain saturates the permeable rock above the impermeable rock making it heavy.
- Waves or a river will erode the base of the slope making it unstable.
- Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
- The debris at the base of the cliff is then removed and transported by waves or river.



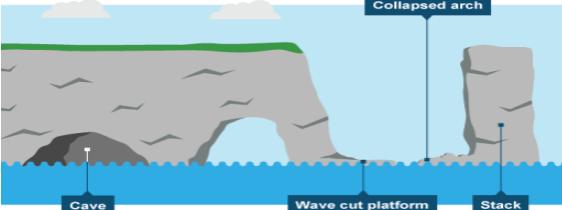
Soil & Landscape

- Soils are created from weathered rocks, organic material and water. Rock types have influence over fertility of soil.
- Low-laying areas such as the Cambridgeshire Fens have deep soil whereas uplands have thin soil.
- Deep soil is more often associated with deciduous woodland rather than coniferous woodlands.

Deposition

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

Formation of Coastal Stack



Example: Old Harry Rocks, Dorset

- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below – arch collapses leaving stack.
- 6) Further weathering and erosion leaves a stump.

Coastal Engineering (Walton-on-the-Naze fieldwork)

Hard Engineering Defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	<ul style="list-style-type: none"> ✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: none"> ✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protection the cliff behind.	<ul style="list-style-type: none"> ✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Soft Engineering Defences

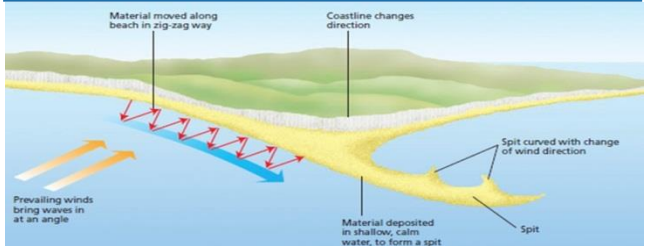
Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> ✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas of the coast are left to flood and erode naturally.	<ul style="list-style-type: none"> ✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

Formation of Bays and Headlands



- 1) Waves attack the coastline.
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area causes deposition.
- 3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

Formation of Coastal Spits - Deposition



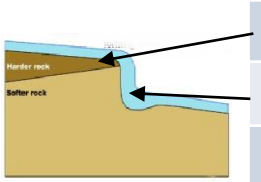
Example: Chesil beach, Dorset (spit that has joined up forming a tombolo)

- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.

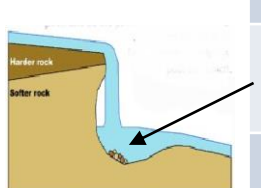
Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall (Upper)



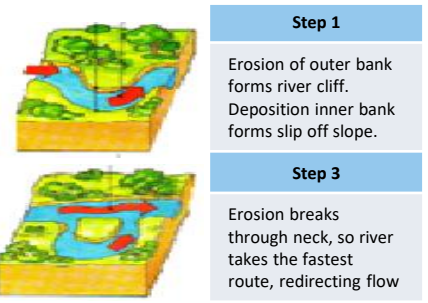
- 1) River flows over alternative types of rocks.
- 2) River erodes soft rock faster creating a step.
- 3) Further hydraulic action and abrasion form a plunge pool beneath.
- 4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
- 5) Waterfall retreats leaving steep sided gorge.



Middle Course of a River

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Formation of Ox-bow Lakes (Lower)



- Step 1**
Erosion of outer bank forms river cliff. Deposition inner bank forms slip off slope.
- Step 2**
Further hydraulic action and abrasion of outer banks, neck gets smaller. (swan's neck)
- Step 3**
Erosion breaks through neck, so river takes the fastest route, redirecting flow
- Step 4**
Evaporation and deposition cuts off main channel leaving an oxbow lake.

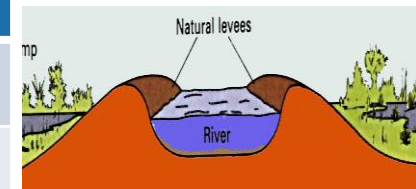
Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials builds up to form natural levees.

- ✓ Nutrient rich soil makes it ideal for farming.
- ✓ Flat land for building houses.



River Management Schemes

Soft Engineering

- Afforestation** – plant trees sock up rainwater, reduces flood risk.
- Demountable Flood Barriers** put in place when warning raised.
- Managed Flooding** – naturally let areas flood, protect settlements.

Hard Engineering

- Straightening Channel** – increases velocity to remove flood water.
- Artificial Levees** – heightens river so flood water is contained.
- Deepening or widening river** to increase capacity for a flood.

Case Study: Walton on the Naze

Location and Background
East coast of the UK, near Clacton. A rural coastal area. Has features such as the Naze tower

Geomorph Processes
Erosion, transportation and deposition all take place in this area. Weathering is a factor in the degradation of the cliffs at the Naze. Slumping takes place as a result of coastal waves, mechanical, and chemical weathering. Problem: Suffers from coastal erosion, London Clay and Red Crag rocks easily eroded. Slumping and LSD takes place.

Management
1977: Major Council Project on Southern Part of the coast – water drainage installed, cliff profile changed, large groynes installed, sea wall enhanced.
1998: £167,000 for 300 tonnes of granite near the Tower – reduced erosion of the cliffs.
1999: Beach replenishment took place to reduce wave speed and erosion.

Case Study: The River Tees

Location and Background
Located in the North of England is flows 137km from the Pennines to the North Sea at Red Car.

Geomorph Processes
Upper – Features include V-Shaped valley, rapids and waterfalls. Highforce Waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.
Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.
Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

Management
-Towns such as Yarm and Middleborough are economically and socially important due to houses and jobs that are located there. Tees barrage system.
-Dams and reservoirs (Cow Green) in the upper course, controls river's flow during high & low rainfall.
- Better flood warning systems, more flood zoning and river dredging reduce impact from flooding.

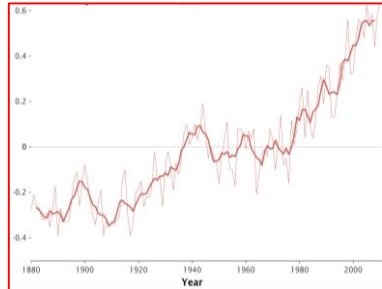
What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

Quaternary geological period

The quaternary period is the last 2.6 million years. During this period temperatures have always fluctuated. The cold 'spikes' are the glacial periods, whereas the warm points are the interglacial periods.

Today's temperature is higher than the rest of the period. Despite alternate cold and warm moments within this period, global temperatures have increased above average in the past 100 years. This current trend is what's become known as global warming.

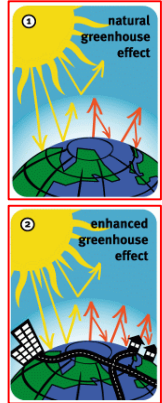


Natural Greenhouse Effect

The Earth is kept warm by a natural process called the Greenhouse Effect. As solar radiation hits the Earth, some is reflected back into space. However, greenhouse gases help trap the sun's radiation. Without this process, the Earth would be too cold to support life as temperature would average as -18°C instead of +15°C.

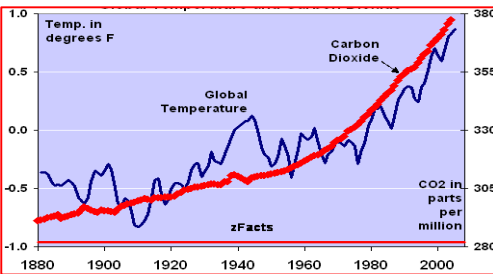
Enhanced Greenhouse Effect

Recently, there has been an increase in humans burning fossil fuels for energy. These fuels (gas, coal and oil) emit extra greenhouse gases. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation but causing less to be reflected. As a result, our Earth is becoming warmer.



Linking CO₂ and Global temperatures

The rate of carbon dioxide and increase in global temperatures is strong. Scientist agree that this increase is caused by human activity.



Evidence for climate change

Earth's temperature has changed over the last 2.6 million years. Scientists know this by collecting a range of evidence that is trapped or stored in the environment around us.

Geological fossil evidence	Plants and animals fossils/remains which favour certain environmental conditions have been found in contradictory conditions, thus suggesting periods of a warmer and colder time. E.g. Mastodon in USA.
Ocean Sediment	Layers of sediment that has built up over time have provided scientists trapped oxygen isotopes. Scientists have used them to calculate and understand that atmospheric temperature have indeed changed.
Ice Cores	Ice cores are made up from different layers that each represents a different historical time. By exploring the water molecules of these cores, scientists have calculated fluctuating temperatures of the atmosphere.
Historical records	Historical records from ancient cave paintings, diaries and written observations have provided evidence of climate change through personal accounts from the people through them.



Topic 2 CHANGING CLIMATE

Past Evidence: The Little Ice Age (1300-1870)

The Little Ice Age was a period of cooling that occurred after the Medieval Warm Period in parts of Europe and North America. Impacts included...

1. Price of grain increased and vineyards become unproductive.
2. Sea ice engulfed Iceland and the sea force around parts of the UK. Frost Fairs were held on rivers such as the River Thames.
3. People suffered from the intense cold winters as food stock were limited.

Recent Evidence for climate change.

In the past 100 years, scientists have become pretty good at collecting accurate measurements from around the world. These measurements have suggested a trend that the climate is yet again changing.

Global temperature data	Evidence collected by NASA suggests average global temperatures have increased by more than 0.6°C since 1950.
Ice sheets and glaciers	Evidence from maps and photos have shown many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by 10% in 30 years.
Sea Level Change	Evidence from the IPCC has shown that the average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from fresh water ice and thermal expansion of the ocean due to higher temperatures.

Evidence of natural change

Climate change has occurred in the past without human ever being present. This suggests that there are natural reasons for the climate to change.

Milankovitch cycle	Milutin Milankovitch argued that climate change was linked to the way the Earth orbits the Sun, and how it wobbles and tilts as it does it. There are three ideas that are thought to change climate. <ol style="list-style-type: none"> 1. Eccentricity: Changes in the shape of Earth's orbit. 2. Obliquity: Changes in how the Earth tilts on its axis. 3. Precession: The amount the Earth wobbles on its axis.
Sun Spots	Dark spots on the Sun are called Sun spots. They increase the amount of energy Earth receives from the Sun.
Volcanic Eruptions	Volcanoes release large amounts of dust containing gases. These can block out sunlight and results in cooler global temperatures.

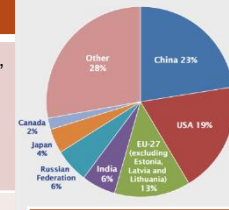
Greenhouse Gases

Most greenhouse gases occur naturally. Some greenhouse gases have greater potential to increase global warming than occurs as different gases trap and absorb different amounts of radiation.

Carbon dioxide	Accounts for 60% of the enhanced greenhouse gases. It is produced by burning fossil fuels through producing electricity, industry, cars and deforestation.
Methane	Accounts for 15% of the enhanced greenhouse gases. 25x more efficient than Carbon dioxide. Produced from landfills, rice and farm animals.
Halocarbons	Human made and makes a tiny proportion of all greenhouse gases. 15000x more efficient at trapping radiation than Carbon dioxide. Produced from air-conditioning, refrigerators and aerosols.
Nitrous Oxide	Accounts for 6% of the enhanced greenhouse effect. 250x more efficient than Carbon dioxide. Produced from fertilisers and car exhausts.

Whose responsible?

LDCs	Countries in Africa, such as Kenya, emit low levels of carbon dioxide. This is due to these countries not being industrialised or having a population wealthy enough to consume lots of energy
EDCs	Countries such as China and India are increasingly more industrialised and therefore are emitting more carbon dioxide. These increasing population sizes and steadily increasing wealth mean more energy is being consumed.
ACs	Countries such as the USA and UK are industrialised with a wealthier population that enjoy lifestyles which required a large consumption of energy.



Not what it seems

Although China is responsible for the highest amount of carbon emission, 1.4 billion people do live there. However, per person the USA (320 million) actually contributes far more CO₂ emissions.

Global impacts of climate change

The impact of rising temperatures is affecting the world socially, economically and environmentally in several potential problematic ways.

Extreme Weather	Climate is causing more unpredictable and severe weather events. This includes more frequent and powerful tropical storms; more extreme heatwaves and lasting droughts. E.g. Typhoon Haiyan 2013
Rising sea levels	Sea levels have risen by 20 cm since 1901. due to thermal expansion, melting glaciers and ice caps. Some coastal countries are now disappearing such as the Maldives in the Indian Ocean.
Food supply	Warmer temperatures and changing rainfall will make it harder to produce a reliable source of food to sustain a rising global population. E.g. In 2011, Russia banned crop exports after a decline in yield.
Plants and Animals	About a quarter of animals and plants on Earth could become extinct. With warmer temperatures and changing rainfall environments will no longer be able to provide for the world's fragile ecosystems.
Disease and Health	Warmer temperatures will increase the spread of infectious diseases like malaria. In addition, more frequent floods could cause more waterborne disease such as dysentery.
Water Supply	People need freshwater to drink but with 1 billion people predicted to not have excess to enough water by 2025 due to climate change, this might cause several social, economic and environmental problems. E.g. fishing, irrigation and sanitation.
Climate refugees	Climate refugees are people who are forced to leave their home due to the impact of climate change. This can be due to sea level rises or extreme weather conditions such as drought.

Rising Sea Levels: Tuvalu

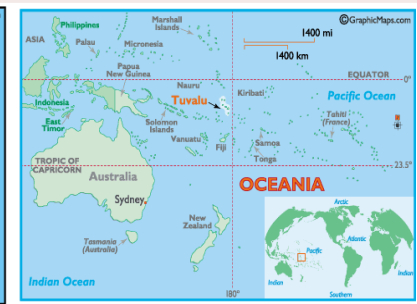
Tuvalu is a group of tiny islands in the South Pacific. Most islands are low-lying with the highest point being 4.5m above sea level. Population is 11,000 people and the economy relies mainly from exporting copra.

Impacts from climate change

Social	Economic	Environmental
<ul style="list-style-type: none"> - Water supply due to droughts becoming more common. - Wells are becoming polluted by seawater. - High tides are starting to threaten homes and roads. 	<ul style="list-style-type: none"> - Increased levels of salinization affecting soil for agriculture. - Coastal erosion is destroying productive farmland. - Main runway threaten by flooding. 	<ul style="list-style-type: none"> - Ocean acidification is reducing fish stocks around the island. - Warmer temperatures are destroying fragile ecosystems such as coral reefs.

Management

- Campaigning internationally for a reduction in carbon emissions.
- Migration to safer islands off the coast of New Zealand.
- Low sea walls have been constructed to prevent erosion and flooding.
- Japan supporting coral reef restoration by introducing new species to damaged reefs.



Climate change management: Paris Agreement 2015

Paris climate conference involved 195 countries making a legally binding global climate deal. This agreement objective is to limit global warming to below 2°C. The aims of this objective are...

- Limit emissions to pre-industrial levels.
- Meet every 5 years to set new targets.
- Communicate plans to the public.
- Provide support to developing countries at reducing emissions.



Impacts of climate change on the UK.

The UK's climate is also changing. It is expected to...

- Increase in average temperature.
- Have warmer, but wetter winters.
- Have warmer and drier summers.

However, not all the impacts to the UK will be negative, there are clear benefits for a changing climate.

Negative impacts of climate change for the UK

Coastal Flooding <ul style="list-style-type: none"> • Vulnerable low lying areas could flood homes and infrastructure. • Increase of coastal erosion. • Damage to the economy. 		Extreme Rainfall <ul style="list-style-type: none"> • Increase in extreme flash floods. • Flood damage to homes and businesses. • Soil contaminations on farmland. 	
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Water Shortages <ul style="list-style-type: none"> • Farmers will find it difficult to irrigate land. • Water restrictions, with London being worst affected. 		Extreme Heat <ul style="list-style-type: none"> • Warmer weather can increase health problems. • Infectious diseases such as malaria might spread. 	
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Positive impacts of climate change for the UK

Tourism <ul style="list-style-type: none"> • More people likely to take holidays within the UK. • The economy could be boosted: helping to create new jobs. • More outdoor events could become common. 		Environment <ul style="list-style-type: none"> • New wetlands from coastal flooding could become established. • New wildlife and plants could be drawn to the UK. 	
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Farming <ul style="list-style-type: none"> • Agriculture productivity may increase under warmer conditions. • Farmers could potentially grow new foods used to warmer climates. 		Industry <ul style="list-style-type: none"> • Heating cost will fall. • Construction industry will be boosted by the need to build sea defences. • New designs produced to cope with conditions. 	
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What is development?

Development is an improvement in living standards through better use of resources.

Economic	This is progress in economic growth through levels of industrialisation and use of technology.
Social	This is an improvement in people's standard of living. For example, clean water and electricity.
Environmental	This is advances in the management and protection of the environment.

Measuring development

There are used to compare and understand a country's level of development.



Economic indicators examples

Employment type	The proportion of the population working in primary, secondary, tertiary and quaternary industries.
Gross Domestic Product (GDP) per capita	This is the total value of goods and services produced in a country per person, per year.
Gross National Income (GNI) per capita	An average of gross national income per person, per year in US dollars.

Social indicators examples



Infant mortality	The number of children who die before reaching 1, per 1000 babies born.
Literacy rate	The percentage of population over the age of 15 who can read and write.
Life expectancy	The average lifespan of someone born in that country.

Mixed indicators

Human Development Index (HDI)	A number that uses life expectancy, education level and income per person.
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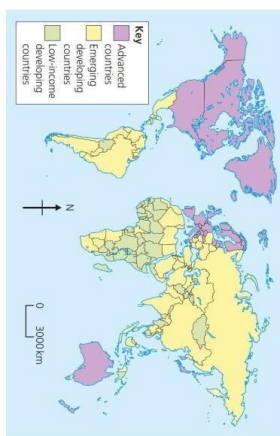
Five stages of economic development.

Rostow's model predicts how a country's level of economic development changes over time. The model also shows how people's standard of living improves.

1. Traditional society	2. Preconditions for take-off	3. Take-off	4. Drive to maturity	5. Mass Consumptions
Subsistence based. i.e. farming, fishing and little trade.	Manufacturing starts to develop with better infrastructure.	Rapid growth with large-scale industrialisation.	Economy grows so people get wealthier & have higher standards of living	Lots of trade with a high level of consumption.

Variations in the level of development

LDCs	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.
EDCs	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.
ACs	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.



Uneven development

Development is globally uneven with most ACs located in Europe, North America and Oceania. Most EDCs are in Asia and South America, whilst most LDCs are in Africa. Remember, development can also vary within countries too.

Topic 6

Dynamic Development

Physical factors affecting development

Natural Resources	<ul style="list-style-type: none"> Fuel sources such as oil. Minerals and metals for fuel. Availability for timber. Access to safe water. 	
Natural Hazards	<ul style="list-style-type: none"> Risk of tectonic hazards. Benefits from volcanic material and floodwater. Frequent hazards undermines redevelopment. 	
Climate	<ul style="list-style-type: none"> Reliability of rainfall to benefit farming. Extreme climates limit industry and affects health. Climate can attract tourists. 	
Location/Terrain	<ul style="list-style-type: none"> Landlocked countries may find trade difficult. Mountainous terrain makes farming difficult. Attractive scenery attracts tourists. 	

Human factors affecting development




Politics	<ul style="list-style-type: none"> Aid can help some countries develop key services and infrastructure faster. Aid can improve projects such as schools, hospitals and roads. Too much reliance on aid might stop other trade links becoming established. 	Trade	<ul style="list-style-type: none"> Countries that export more than they import have a trade surplus. This can improve the national economy. Having good trade relationships. Trading goods and services is more profitable than raw materials.
Education	<ul style="list-style-type: none"> Education creates a skilled workforce meaning more goods and services are produced. Educated people earn more money, meaning they also pay more taxes. This money can help develop the country in the future. 	Health	<ul style="list-style-type: none"> Lack of clean water and poor healthcare means a large number of people suffer from diseases. People who are ill cannot work so there is little contribution to the economy. More money on healthcare means less spent on development.
Aid	<ul style="list-style-type: none"> Corruption in local and national governments. The stability of the government can effects the country's ability to trade. Ability of the country to invest into services and infrastructure. 	History	<ul style="list-style-type: none"> Colonialism has helped Europe develop, but slowed down development in many other countries. Countries that went through industrialisation a while ago, have now develop further.

Consequences of Uneven Development

Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and education.

Wealth	People in more developed countries have higher incomes than less developed countries.
Health	Better healthcare means that people in more developed countries live longer than those in less developed countries.
Education	More developed countries have better standards of education available than those in less developed countries.

Barriers to ending Poverty

Debt	 <p>Many LIDCs have huge national debts from borrowing from wealthy countries and organisations. With high interest rates, these debts are difficult to wipe out and can lead to a spiral of decline. This situation makes it difficult for these countries to invest in services and infrastructure.</p>
Trade	 <p>Countries with a negative balance of trade, import more than they export make development difficult. Also ACs have TNCs that operate in LIDCs. These companies take profits away from LIDCs to ACs where their headquarters are.</p>
Political unrest	 <p>Widespread dissatisfaction with the government can be caused by political unrest, corruption and a lack of investment and attention into services (i.e. education and healthcare).</p>

Breaking out of Poverty

Countries can try various ways to reduce poverty and increase development. These often involve different types of aid that can either be short term or long term strategies.

Top Down	These are large scaled, government led and expensive schemes involving money borrowed from wealthier countries. There is little community involvement but instead large scale projects.
Bottom Up	These are small scaled, local led and less expensive schemes. They involve communities and charities developing local businesses and housing.
Short term	This aid is sent to help countries cope with emergencies such as natural disasters.
Long term	This is aid given over a long period to help countries develop through investing in projects such as education and healthcare.

Trade	Fair trade can allow for fair wages. Also grouping with other countries in the form of trading blocs can increase links and increase the economy.
Debt Relief	Wealthier countries can cut or partly cut debt to countries that have borrowed money. This allows for money to be reinvested in development.


Positives and Negatives of Aid

Positives 	Negatives 
Allows for immediate or long-term investment into projects that can develop a countries prospects.	Local people might not always get a say. Some aid can be tied under condition from donor country.

Are LIDCs likely to stay poor? Case Study: Zambia

Location & Background





Zambia is a LIDC in central southern Africa. A **landlocked** country surrounded by eight countries. It has a population of **14.5 million**. The capital is **Lusaka** with a population of 1.7 million.



Current level of development

- GNI per capita is **\$3070** compared to a world average of **\$10,858**
- Level of wealth per person is **significantly less** than other LIDCs across the world.
- High birth rate & slower death rate equals growing population.
- A long history of **poverty** and **colonial rule**.
- HDI of **0.43** with **low life expectancy** at 52 years.
- Country is **reliant on copper** with **64%** of all exports.
- Country gained independence from Britain in 1964

Influences upon Zambia's development

Political 	Social 	Physical 	Economic 
<ul style="list-style-type: none"> Zambia was under British Colonial Rule from 1888 to 1964 Been a peaceful democracy since then Holds elections every few years and there has been little political unrest 	<ul style="list-style-type: none"> 1980s HIV / AIDS spread ↑ death rate, ↓ life expectancy. 1.2 million with HIV Severe drought 1981 – 1983 so people faced high food prices Some achievement on MDGs Good shops and schools if can afford it 	<ul style="list-style-type: none"> Many national parks Abundant natural resources Over 50% of the land suitable for farming No sea border so trade difficult Tropical climate with wet and dry season Droughts - starvation / poverty 	<ul style="list-style-type: none"> Copper industry accounts for 64% exports. Also cobalt, tobacco, flowers, cotton Economy grown since 2000 Good financial services Access to markets good Growth in tourism, farming and HEP to diversify economy

Zambia & Rostow's Model Millennium Development Goals


- Zambia has improved education and healthcare due to investments from TNCs. More trading links have developed. As a result, Zambia is at start stage 3.
- More tourism, HEP and transport, better technologies & quality of life is allowing for Take off to emerge.



Set by the UN to set targets to reduce poverty.

+ Zambia is on track with primary education, gender equality, disease and global partnership.

- Extreme poverty, Child mortality, maternal health, and environmental sustainability are still issues



Millennium Development Goals

Investment from TNC Aid & Debt relief Development strategy for Zambia

<p>A range of TNCs such as Associated British Foods are now operating in Zambia at a primary, secondary and tertiary level.</p> <p style="color: green;">+ Investment in infrastructure is increasing tourism.</p> <p style="color: green;">+ Increase employment levels and people receive fair wages.</p> <p style="color: red;">- Some TNC pay low salaries and working conditions are poor.</p> <p style="color: red;">- TNCs sometimes take advantage of the unstrict regulations in place.</p>	<ul style="list-style-type: none"> People receive aid from charities such as Water Aid and Room to Read. Water Aid is sustainable for villages and encourages healthier lifestyles. Wealthier countries encouraged the decline of the country's massive debt. Less debt repayments has meant more reinvestment. 	<table border="1" style="width: 100%;"> <tr> <th style="background-color: #800080; color: white; padding: 5px;">Bottom-up</th> <th style="background-color: #800080; color: white; padding: 5px;">Top-down strategies</th> </tr> <tr> <td style="vertical-align: top;"> <p>This is led by local people and are known as 'grassroot' project.</p> <p style="color: green;">+ Water Aid has helped locals create sanitation and water systems. Helps 54 000 - 4 people with safe water and 42 000 with safe sanitation a year</p> <p style="color: red;">- Bottom-up approaches can be localized and depend on volunteers.</p> </td> <td style="vertical-align: top;"> <p>This is large scale investment at a national level.</p> <p style="color: green;">+ In 1950s Kariba Dam was built producing a reliable source of energy. New industries developed such as fishing and tourism</p> <p style="color: red;">- 57 000 Tonga people have been evicted from HEP dam areas to less fertile areas. Natural ecosystems affected</p> </td> </tr> </table>	Bottom-up	Top-down strategies	<p>This is led by local people and are known as 'grassroot' project.</p> <p style="color: green;">+ Water Aid has helped locals create sanitation and water systems. Helps 54 000 - 4 people with safe water and 42 000 with safe sanitation a year</p> <p style="color: red;">- Bottom-up approaches can be localized and depend on volunteers.</p>	<p>This is large scale investment at a national level.</p> <p style="color: green;">+ In 1950s Kariba Dam was built producing a reliable source of energy. New industries developed such as fishing and tourism</p> <p style="color: red;">- 57 000 Tonga people have been evicted from HEP dam areas to less fertile areas. Natural ecosystems affected</p>
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What is Resource Reliance?

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

Resource Required

Resources such as food, energy and water are what is needed for basic human development.

FOOD



Without enough nutritious food, people can become **malnourished**. This can make them ill. This can prevent people working or receiving education.

WATER



People need a supply of **clean and safe water** for drinking, cooking and washing. Water is also needed for food, clothes and other products.

ENERGY



A good supply of energy is needed for a basic standard of living. People need **light and heat** for cooking or to stay warm. It is also needed for industry.

Demand outstripping supply

The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations

1. Population Growth



- Currently the global population is **7.3 billion**.
- Global population has risen **exponentially** this century.
- Global population is expected to reach **9 billion by 2050**.
- With more people, the **demand** for food, water, energy, jobs and space **will increase**.

2. Economic Development



- As **LIDCs** and **EDCs** develop further, they require **more energy** for industry.
- LIDCs** and **EDCs** want similar lifestyles to **ACs**, therefore they will need to **consume more resources**.
- Development means **more water is required** for food production as diets improve.

Resource Reliance Graph

Consumption – The act of using up resources or purchasing goods and produce.

Carry Capacity – A maximum number of species that can be supported.

Resource consumption exceeds Earth's ability to provide!



3. Changing Technology and Employment

- The demand for resources has driven **the need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

Reasons for NOT Meeting Modern Resource Demands.

Climate	<ul style="list-style-type: none"> Global warming effects cycles and seasons and therefore farming. Rainfall patterns are changing and are becoming unpredictable. This is a problem for farming.
Geology	<ul style="list-style-type: none"> Not all countries have access to fossil fuels or suitable landscape for renewables. Many minerals are finite and therefore once used will reduce the resources available. Rock types might limit the availability to store water.
Conflict	<ul style="list-style-type: none"> War can disrupt transport of resources by damaging roads and water pipes.
Poverty	<ul style="list-style-type: none"> LIDCs are unable to afford technology to effectively exploit the natural resources available.
Natural Hazards	<ul style="list-style-type: none"> Increase in hazard events due to climate change. Prime agricultural regions in Asia and Africa and are also in hazard zones. Has the ability to destroy infrastructure needed to transport resources.

Topic 8

Resource Reliance



Environment and Food: Fishing and Farming

	Methods	Environmental and Ecosystems
Fishing	Bigger nets and fishing boats have allowed for greater catches. GPS and sonar has also find the fish easily.	<ul style="list-style-type: none"> Overfishing of certain fish has caused their decline. Dredging can damage seafloor habitats. Decline of one species has a knock on effect on other marine species.
Farming	Tractors, computer programming and GPS technology is producing food more effectively and at a larger scale.	<ul style="list-style-type: none"> Field sizes have caused hedgerows to decline in biodiversity. Fertilisers and pesticides enter water courses and harm or kill organisms. Heavy machinery can cause soil erosion.

Environment and Energy: Deforestation and Mining

	Methods	Environmental and Ecosystems
Deforestation	Logging using modern machinery and transportation has made deforestation more productive & convenient.	<ul style="list-style-type: none"> 2 billion people depend on wood for fuel, which therefore creates high CO2 emissions Forests provide for important habitats. Clearing of forests leads to soil erosion. Tree intercepts rain and prevents flooding.
Mining	Large machines and drill technology can remove and reach through material effectively.	<ul style="list-style-type: none"> Mining waste can pollute soil and contaminate water supplies. Habitats are destroyed in mining zones. Fossil fuels burnt release greenhouse gases

Environment and Water: Reservoirs and Water Transfer



	Methods	Environmental and Ecosystems
Reservoirs	Increasing storage to hold more water and constructing more dams to control river flow can provide a reliable source of water.	<ul style="list-style-type: none"> Can flood a large area of land and damage habitats and natural landscapes. Dams can be a barrier for certain species to migrate upstream. Natural flow of sediment is disrupted, which then reduces fertility of land further down.
Water Transfer	Constructing pipes and canals to divert water surplus to areas in need of a water supply.	<ul style="list-style-type: none"> Large-scale engineering works can damage ecosystems along the route. Lots of energy is required to pump water over long distances.



Food Security

'**Food Security**' is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to '**Food Insecurity**' which is when someone is unsure when they might next eat.

Human



- Poverty** prevents people affording food and farmers buying modern equipment.
- Poor infrastructure** makes food difficult to transport fresh food.
- Conflict** disrupts farming and prevents supplies.
- Food waste** due to poor transport and storage.
- Climate Change** is affecting rainfall patterns making food production difficult.

Physical



- Temperature** needs to be ideal for certain crops to grow.
- The **quality of soil** is important to ensure crops have the necessary nutrients.
- Water supply** needs to be reliable to allow food to grow.
- Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to feed large populations.
- Extreme weather** events can damage crops (i.e. floods).

Malthus and Boserup's Theories about Food Supply

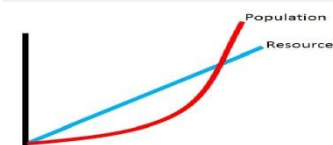
With the population growing very quickly, there are different ideas about whether or not this will lead to a food crisis.

Malthus Theory

- Believed that **population would increase faster than food supply**.
- This would lead to a lack of food being available.
- Malthus believed this would cause **large scale famine, illness and war**
- This would occur until population returned to level that can be supported.

Boserup Theory

- Believed that however big the population grew, **people would find ways to manage**.
- If food supplies became limited, **people would find new ways** to increase production.
- These solutions would often involve **creating new technologies**.



Measuring Food Security

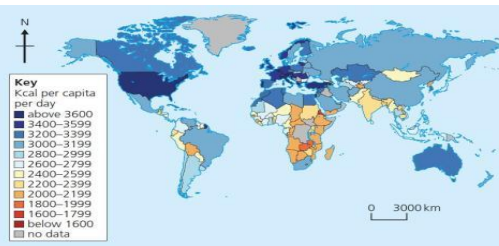
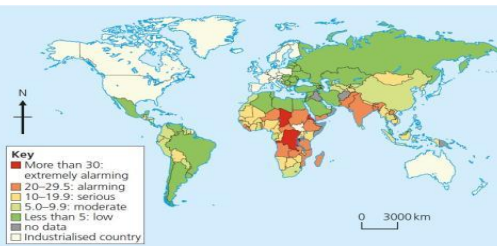
Attempts to Achieve Food Security

Food security varies around the world. Some people and places are more food secure than others. This can often depend on how much a country can grow and is able to afford.

There are various measures to maintain or even improve our food security. These measures are often taken to be **socially, economically, environmentally** viable for the longer term.

The Global Hunger Index

Daily Calorie Intake



This shows how many people are suffering from **hunger or illness** caused by lack of food. The index gives a value for each country from **0** (no hunger) to **100** (extreme hunger).

This shows how many **calories per person** that are consumed on average for each country. Can indicate the global distribution of **available food & food inequality**,

Social

Economic

Environmental

Ethical Consumerism



This involves buying products that have a **positive social, economic and environmental impact** today, without **compromising future generations**.

Fairtrade

- This is a global movement to give farmers a **fairer price for their products**.
- The profits benefit the community **with schools and medical facilities**.
- Involves using farming methods that **protects rather than destroys environments**.

Food Waste

- One-third of all food gets lost or wasted.
- Aim to **eat locally sourced food** to reduce waste through transport.
- Eating 'ugly' food despite it not being 'ideal' can prevent waste and **save money**.
- Prevents wasted energy for producing food and therefore **reduces CO2 emissions**.

Case Study: Tanzanian Food Security

Food Availability in Tanzania

The Tanzanian population is around **51 million** and is ranked **98/109** countries in the Global Food Security Index.

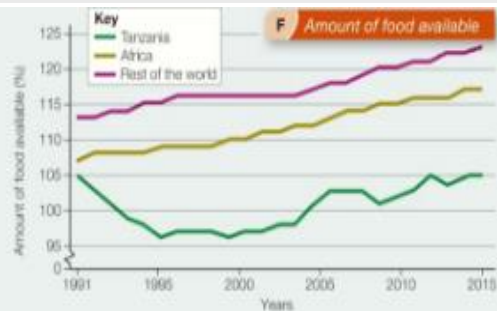
- Has rating of **89/116** countries on Global Hunger Index = serious
- GHI score and child mortality is decreasing
- Food distribution is improving but still lower than Africa and RoW

Food consumption in Tanzania

Average daily calorie intake in Tanzania has **increased** from **1696** in **1964** to **2137** by **2009**.

Reasons for this increase include:

- Less people living in poverty (less than \$1.25 per day)
- Implementation of large and small scale projects to help with food production



Success in securing local food security

Goat Aid

- Example of **bottom-up aid**
- Run by UK based charity Farm Africa
- Imported Toggenburg goats – good milk producers
- Cost £200,000
- Trained villagers how to keep them, including treat simple diseases
- Given 'on credit' so had to repay
- Profits for farmers on the scheme increased **2 fold** compared to those not

Effectiveness of past attempt at food security

1967 government decided should grow all own food. Asked Canada for help in growing wheat - \$95 million in aid.

Success – grew 60% of own wheat – self sufficient in 1992 drought

Failure – yield low, cheaper to import. Livelihoods of Barabaig tribe threatened (40,000). Couldn't afford spare parts for tractors/combine harvesters. Only a few jobs created.

Effectiveness of present attempts at food security

SAGOT project started in 2010. Improve farming in 'growth corridor'. Millions being invested by TNs, charities, government. Develop modern agricultural economy.

Early successes – Kilombero plantation – doubled rice yield. 7300 rice growers – better connected – some produced **8 times** more rice.

Criticisms – benefits large commercial farms. Small landowners not involved in decisions and lost land.

Food Production



This involves producing as much food as possible in as small a space as possible. They often involve using **machines and chemicals** to gain as much produce as they can.

Intensive Farming

- Makes the most of the land and allows for higher yields. This can make growing food more **productive and therefore cheaper** to produce.
- Chemical fertilisers, pesticides and herbicides can **pollute the environment** and **harm people**, animals and insects.

Organic Methods

- This involves the banned use of chemicals and **ensuring animals are raised naturally**.
- This can lead to **lower yields of 20%** and products being **more expensive**.



Technological Developments

Through better understanding of science and improved technology, it is now possible to **change the food we grow and protect and harvest the crops more effectively**.

Genetically modified (GM)

- Involves changing the DNA of foods to enhance their productivity and properties.
- Crops can be **better protected from disease and drought**, but also made larger or include more **health benefits**.

Hydroponics

- This is a method of growing plants without soil. Instead they use nutrient solution.
- Less water is needed and a **reduced need for pesticides** to be used.
- However, this method is **very expensive** so only used for high value crops.



Small Scale 'Bottom Up' Approaches

This involves a **small scale production of food and relies on individuals and communities, rather than government or large organisations**.

Urban Gardens

- Bottom-up approach – 15% world's food grown in urban areas
- Small community gardens providing healthy food – too expensive to buy in LIDCs/EDCs
- Can also include livestock (chickens etc.) – can carry diseases
- Chongqing, China – garden on factory roof – staff tend crops and take home for free

Permaculture

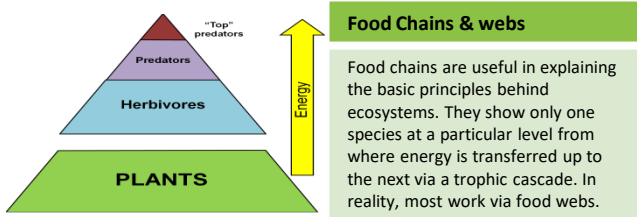
- This involves **people growing their own food** and **changing their eating habits**.
- This can create **more natural ecosystems** and fewer resources are required.

What is an Ecosystem?

An ecosystem is a system in which organisms interact with each other and with their environment.

Ecosystem's Components

Abiotic	These are non-living, such as air, water, heat, rock.
Biotic	These are living, such as plants, insects, and animals.
Flora	is plant life occurring in a particular region or time.
Fauna	is all animal life of any particular region or time.



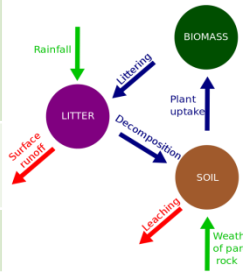
Food Chains & webs

Food chains are useful in explaining the basic principles behind ecosystems. They show only one species at a particular level from where energy is transferred up to the next via a trophic cascade. In reality, most work via food webs.

Nutrient cycle

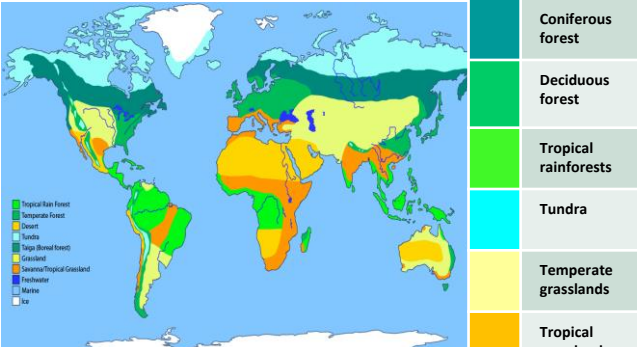
Plants take in those nutrients where they are built into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by decomposers.

Litter	This is the surface layer of vegetation, which over time breaks down to become humus.
Biomass	The total mass of living organisms per unit area.



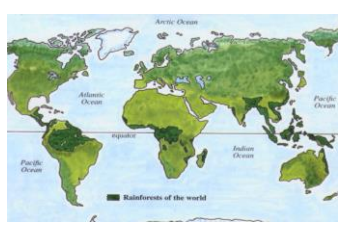
Biomes

A biome is a large geographical area of distinctive plant and animal groups, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.



The most productive biomes – which have the greatest biomass- grow in climates that are hot and wet.

Tropical Rainforest Biome



Distribution of Tropical Rainforests

Tropical rainforests are centred along the Equator between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. The Amazon is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.



Convective rainfall

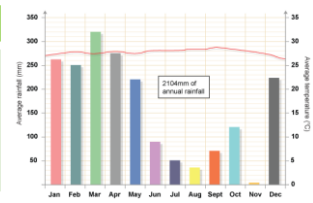
- The roots of plants take up water from the ground and the rain is **intercepted** as it falls.
- As the rainforest heats up, the water evaporates into the atmosphere.
- Finally, the water condenses and forms clouds to make the next day's rain.

Rainforest nutrient cycle

The hot, damp conditions on the forest floor allow for the rapid decomposition of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become infertile

Climate of Tropical Rainforests

- Evening temperatures rarely fall below 22°C
- Due to the presence of clouds, temperatures rarely rise above 32°C
- Most afternoons have heavy convective rain
- At night with no clouds insulating temperature drops



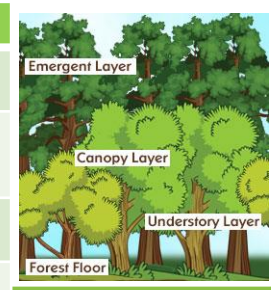
Topic 4 Sustaining Ecosystems

Interdependence in the rainforest

A rainforest works through interdependence. This is where the plants and animals depend on each other for survival.

Layers of the Rainforest

Emergents	Highest layer with tree reaching 50 metres.
Canopy	Most life is found here as it receives 70% of the sunlight and 80% of the light.
Under Canopy	Consists of trees that reach 20 metres high.
Shrub Layer & Forest Floor	Lowest layer with small trees that have adapted to living in the shade.



Rainforest soil profile - latosols

Leaf Litter	Thin litter layer rapidly decomposes in heat.
Top Soil	Shallow topsoil is a mixture of decomposed organic matter and minerals. Normally red.
Sub Soil	The sub-soil is deep due to weathering of rocks below.
Rock	Underlying rock weathers quickly at high temperatures to form sub-soil.

Biome	Location	Temperature	Rainfall	Flora	Fauna
Topical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate forest	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500mm/year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

Tropical Rainforest Biome

Adaptations to the rainforest		Rainforest inhabitants
Sloths	Are camouflaged to forest environment.	Tribes such as the Sanema Indians who live along the Orinoco river live sustainably, using shifting cultivation. The forest provides inhabitants with... <ul style="list-style-type: none"> • Food through hunting and gathering. • Natural medicines from forest plants. • Homes and boats from forest wood.
Buttress Roots	Support tall trees & absorb nutrients.	
Drip Tips	Allows heavy rain to run off leaves easily	
Lianas & Vines	Climbs trees to reach sunlight at canopy.	



Effects of Human Activity on the Rainforest		Benefits of the rainforest
Logging	Agriculture	Raw Materials
<ul style="list-style-type: none"> • Most widely reported cause of destructions to biodiversity. • Timber is harvested to create commercial items such as furniture and paper. • Has led to violent confrontation between indigenous tribes and logging companies. 	<ul style="list-style-type: none"> • Large scale 'slash and burn' of land for ranches and palm oil. • Increases carbon emission. • River saltation and soil erosion increasing due to the large areas of exposed land • Increase in palm oil is making the soil infertile. 	Commonly used materials such as timber and rubber are found here.
Mineral Extraction	Tourism	Water
<ul style="list-style-type: none"> • Precious metals such as gold and iron ore, as well as oil, are found in the rainforest. • Areas mined can experience soil and water contamination. • Indigenous people are becoming displaced from their land due to roads being built to transport products. 	<ul style="list-style-type: none"> • Mass tourism is resulting in the building of hotels in extremely vulnerable areas. • Lead to negative relationship between the government and indigenous tribes • Tourism has effected wildlife (apes) by exposing them to human diseases. 	Controls the flow of water to prevent floods/droughts regions..
		Food
		Important foods such as Bananas, pineapples and coffee are grown there.
		Health
		25% of modern medicines are sourced from rainforest ingredients.
		Energy
		Large dams generate 2/3 of Brazil's energy needs through HEP.
		Climate
		Acts as carbon sinks by storing 15% of carbon emissions.

Case Study: Sustainable Rainforest Management in Costa Rica: Samasati Nature Retreat



Location & Background	Threats to the Costa Rican Rainforest
Costa Rica is a small country in Central America. It is home to 6% of the world's biodiversity. The country attracts 6 million tourists a year.	<ul style="list-style-type: none"> • Cattle Ranching and agricultural development by clearing land through slash & burn methods. • Gold and other metal mining meant large scale soil and rock removing. This meant areas were deforested and chemicals entered water systems. • By 1990, 32,000 hectares of forest were cut down each year – devastating the fragile ecosystem.
Ecotourism	
Ecotourism is tourism that is directed towards the natural environments & conversation. Samasati is a popular ecotourism destination in the country.	
Advantages	
<ul style="list-style-type: none"> • Local people are employed – hotel staff, guides, famers, transport • Locally sourced produce is used throughout 	
Disadvantages	
<ul style="list-style-type: none"> • Land prices have increased. • It is expensive and only small scale. 	
Rainforest Management	
<ul style="list-style-type: none"> • Government created 28 National Parks with 24% of the country's land protect. • Laws and enforcement meant that deforestation had fallen from 1.8 to almost zero by 2005. • Agroforestry encourages growing trees and crops together to create better farming conditions. • Afforestation has led to the replanting of trees to replace original forest that have been lost. 	

Polar/Tundra Regions Biome

Distribution of Polar Regions		Climate Change on Polar Regions						
Arctic	Antarctic	Scientific reports outline the effect global warming is having on these regions. Ice sheets and glaciers are melting at an alarming rate leading to fears of rising sea levels. Thawing of permafrost is increasing methane emissions and the decline of arctic ice is creating waves that are capable of causing unseen coastal erosion.						
Is the region north of latitude 60°N around the North Pole.	A continent south of latitude 60°S around the South Pole.							
								
Climate		Arctic soil profile						
Polar areas are very cold with temperatures rarely reaching above 0 °C. Winters average below -40 °C, the Antarctic being colder and drier than the Arctic.		<table border="1"> <tr> <td>Active Layer</td> <td>Thaws in the summer. Becomes deeper towards pole.</td> </tr> <tr> <td>Permafrost</td> <td>Permanently frozen all year. Layer Increases further north.</td> </tr> <tr> <td>Bed Rock</td> <td>Low temperatures weathers rock slowly = less nutrients.</td> </tr> </table>	Active Layer	Thaws in the summer. Becomes deeper towards pole.	Permafrost	Permanently frozen all year. Layer Increases further north.	Bed Rock	Low temperatures weathers rock slowly = less nutrients.
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Land & Sea Features		Effects of Human Activity in Polar Regions	
Arctic	Antarctic	Oil & Gas exploration	Whaling
Large areas are permafrost. At sea, most of the region is frozen over.	Large and thick ice sheets. A mountain range crosses the continent.	<ul style="list-style-type: none"> • Arctic holds a large amount of untapped oil and gas. • Oil spills eg Exxon Valdez 1989 threaten ecosystems as clean up operations are slow & costly. 	<ul style="list-style-type: none"> • Hunting of whales was a major industry – this led to a rapid decline in whale populations. • Many countries have banned whaling, but a few still continue
Flora (Plants)	Fauna (Animals)	Fishing	Tourism
There are very few plants in polar areas – some lichens, mosses and grasses along the coastal areas, more in the Tundra.	Relatively few species of animals. polar bears, penguins and marine mammals like whales, narwhals, seals, walrus and krill and plankton in seas.	<ul style="list-style-type: none"> • Has made area possible to fish large untapped stocks. • The polar areas are difficult to police due to harsh conditions. • Collapse of the fish stocks there might damage ecosystems. 	<ul style="list-style-type: none"> • Tourism eg cruises, is steadily growing in polar regions. • Travel by tourists increase emissions further. • Wildlife may become disturbed by tourists getting up close.

Case Study: Small Scale Sustainable Management: Ice Hotel, northern Sweden



Background	Case Study: Global Scale Sustainable Management: The Arctic Council
It is built each year in winter from local ice from River Torne and caters for small numbers of guests. Everything – from glasses to furniture, is made of ice	
Features and Activities	Background
<ul style="list-style-type: none"> • The location has good facilities such as a dining room, electricity supply and transport. • Tourists can enjoy activities such as ski tours, wildlife viewing and meeting the local Sami. 	Formed in 1996 from surrounding countries and indigenous tribes. Its focus is environmental protection but is not yet in international law.
Sustainable Management	Basic Principles of the Arctic Council
<ul style="list-style-type: none"> • Strict guidelines on how tourists should behave are enforced to respect the natural environment. • Solar panels used to reduce carbon emissions. • All waste is carefully contained and removed. 	<ul style="list-style-type: none"> • The Council has carried out studies on the effects of climate change, shipping and mineral extraction. • However the Arctic Council has no legal powers to stop countries doing anything there. • Other treaties such as the Paris Agreement (2015) do have legally binding powers to limit global warming that should help to preserve the Arctic
	Successful?
	It is still new – threats such as USA withdrawing from Paris Agreement could damage it. Countries are now claiming the Arctic sea floor as theirs but without agreement.

What is Urbanisation?

This is an increase in the amount of people living in urban areas such as towns or cities. In 2007, the UN announced that for the first time, more than 50 % of the world's population live in urban areas.



Settlement Hierarchies

If we group and classify a number of settlements according to their size and shape, the result is settlement hierarchy.

Key Characteristics of Settlement Hierarchy.

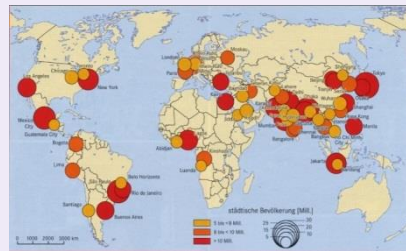
- The number of services that a settlement provides increases with settlement size.
- Small settlements will only provide low-order services such as a post offices.
- Larger settlements and conurbations have a much larger sphere of influence than smaller ones.
- The range of a service or product is the maximum distance people are prepared to travel to purchase it.



Types of Cities

Megacity

An urban area which over 10 million people living there.



More than two thirds of current megacities are located in either EDCs and LIDCs). The amount of megacities are predicted to increase from 28 to 41 by 2030.

World City

Cities that are centres for trade and business. They hold global influence.



Key 'world cities' include London, New York, Tokyo and Paris. Most are located within ACs but are now gradually expanding into EDCs, for example Moscow.

Causes of Urbanisation

The movement of people from rural to urban areas.

Push

- Natural disasters
- War and Conflict
- Mechanisation
- Drought

Pull

- More Jobs
- Better education & healthcare
- Increased quality of life.
- Following family members.

Consequences of Rapid Urbanisation in LIDCs

Although there are lots of opportunities in urban areas, the rapid growth can place many pressures that causes various problems.

Social Consequences

- Little official housing available.
- Infrastructure struggles to support growing population.
- Increase in crime rates.

Environmental Consequences

- Rubbish may not be collected.
- Sewage and toxic waste pollutes river environments.
- Increased congestion produces more pollution.

Economic Consequences

- May not be enough jobs – increased unemployment.
- Informal sector increases Little access to education and healthcare.

Counter-Urbanisation in ACs

This is the movement of people from inner city area to countryside areas.

Push

- Overcrowding and pollution.
- Unemployment increases.
- Inner city deprivation.
- Traffic congestion increases CO².

Pull

- Green spaces & family friendly.
- New modern housing estates.
- Improved public transport.
- Rents cheaper on outskirts.

Topic 5

Urban Futures

Suburbanisation

This is the movement of people from city centres to the outskirts.

Push

- Overcrowding and pollution.
- Unemployment increases.
- Deindustrialisation of centre.
- Traffic congestion.

Pull

- Green spaces & family friendly.
- New modern housing estates.
- Improved public transport.
- Rents cheaper on outskirts.

Consequences of Suburbanisation

Environmental Consequences

- New housing damages countryside and habitats.
- Increase of cars adds air pollution.

Economic Consequences

- People leave centres and they become deserted.
- Unemployment increases, which leads to poverty.

Social Consequences

- Offices and businesses are abandoned.
- Economic and ethnic segregation.

Rapid Urbanisation: Life in Kibera, Kenya

Background

Kibera is just on the outskirts of the capital city Nairobi in Kenya. Kenya has a total population of 41 million, of which 3 million live in Nairobi, and 1 million live in the Kibera slum.

Effects of Urbanisation

Social

- 80% live without electricity.
- High diseases rate and low life expectancy.
- Overcrowding in housing.

Economic

- 50% unemployment rate.
- Business is limited due to poor infrastructure.

Environmental

- Large scale pollution issues.
- Slums are heavily populated with overcrowding problems.
- River pollution.

Management

- Aid agencies have added healthcare facilities to limited the spread of diseases such as cholera.
- 2 new clean water pipes have recently been added so that the community can access some clean water, reducing illness.

Re-urbanisation in ACs

This is the movement of people back into urban areas.

Push

- Lack of jobs in rural and suburban areas.
- Less leisure and entertainment in rural areas.
- Counter-urbanisation may have increased house prices.

Pull

- Redevelopment of brownfield sites with improved housing.
- Young people are attracted to the Universities.
- People are attracted to entertainment facilities available.

Consequences of Re-urbanisation

Social Consequences

- Shops and services benefit from the additional residents.
- Increase in tension between new and older residents.
- House prices in redeveloped areas increase.
- Schools benefit from the increase of students.
- More jobs and less employment within the area.



Environmental Consequences

- Redevelopment of brownfield sites improves old industrial and polluted areas
- Decreases pressures on greenfield areas.
- Could destroy urban wildlife.

Economic Consequences

- New shops and services will improve local economy.
- Jobs available may not be accessible to original residents.
- Urban tourism may increase.

Informal Housing

This is housing that is built on land which does not belong to those who are building it. This may be on land that is unsuitable due to its surroundings.



Internal Growth

Internal growth occurs when urban areas experience rapid rates of population growth. This comes as a result of a large amount of arrival of people in cities, who after finding a job, house and partner will have children. This occurs mostly in LIDCs.

Greenbelt Area

This is a zone of land surrounding a city where new building is strictly controlled to try to prevent cities growing too much and too fast.



Conurbanisation

A conurbation is a region comprising a number of cities, large towns, and other urban areas that, through population growth have merged to form one continuous urban or industrially developed area.
For example: Coventry, Wolverhampton, Walsall, West Bromwich, Solihull.

AC: Challenges & Opportunities for Cities: Birmingham Case Study



EDC: Challenges & Opportunities for Cities: Istanbul Case Study



Location and Background

Birmingham is the largest city in the Midlands and the 2nd largest in the United Kingdom. The city is at the heart of a conurbation which includes cities such as Walsall and Coventry.



City's Importance

- Has the fastest rate of job growth in the country.
- Largest manufacturing centre in the UK, especially for clothing.
- Contains eight independent universities.
- After London the most important financial centre in the UK.
- Has major transport links that connect effectively to the UK and the world.

Location and Background

Istanbul is a coastal city situated in Turkey, at the Bosphorus strait. It is between two continents – Europe and Asia, but the city itself is in Europe.



City's Importance

- Istanbul is important because it is in a country that spans over two continents.
- It is also important because it is home to two great empires and history, the Ottoman and the Roman empire.
- Istanbul was the capital of Turkey, but that is now Ankara.
- Istanbul was called Constantiople but it is now known as Istanbul.

Migration to Birmingham

The history of Birmingham spans 1400 years of growth. It started in the 7th century as a small anglo-saxon hamlet.

- Many commonwealth populations, such as India, the Caribbean and Pakistan moved in during the 1950s.
- The city is also home to a large Irish community from the mid 21st century.
- Polish, Ukrainian & Hungarian refugees arrived after WWII.



Birmingham's way of Life

- The city benefits by the diversity and many different cultures.
- The population benefits from many companies and shops locating there.
- Excellent transport links and lots of commuters.
- Good entrainment centres and night life.



Migration to Istanbul

The main type of migration to Istanbul is rural to urban migration from other areas of Turkey – national migration. People move to Istanbul to seek a better quality of life. International migration has also changed Istanbul – many North African's have flocked to Turkey, particularly Syrian's in recent years due to conflict and war.

Istanbul's way of Life

- The city boasts Turkish culture whilst also being very multicultural.
- Istanbul has benefitted greatly from tourism in the past 20 years with more flights to its airport. This has meant more jobs in tourism and more diversity in the services provided.

City Challenges

- There is a lack of affordable housing, especially for the young generation.
- Social inequality including deprivation and poverty is a problem for young people.
- Some communities are being replaced by students (studentification) which then require different services.
- The rapid increase in population has caused pressures on transport and services such as education.

Bull ring Redevelopment

The bull ring shopping centre in the heart of the city was redevelopment to offer more services to the population. It has been very successful. People travel far and wide to visit it. It is considered one of the best shopping mall's in the UK.

City Challenges

- Housing – Gecekondu's – slum or shanty housing has been erected in Istanbul over the past 30 years due to a boom in population – this has led to overcrowding and reduced quality of life.
- Informal Sector Jobs – Istanbul has problems with informal jobs – people do work for very little money and are not taking part in the whole economy.
- Traffic congestion – Istanbul is one of the worst cities in the world for traffic.



Self-help sch

- Istanbul have enticed young professionals into the housing market to try and improve the conditions of some neighbourhoods, such as Beyoglu and Esenler suburbs where there has consequently been a rise in quality of life and standards of housing.
- The metro system is an example of sustainable transport in the city – it has expanded over the past few years with 8 routes, is cost-effective, environmentally friendly, and can carry more passengers than cars.