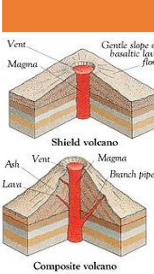
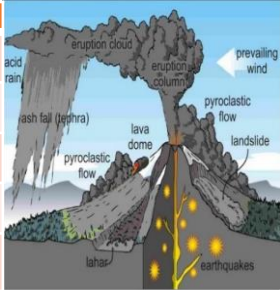
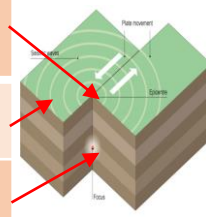


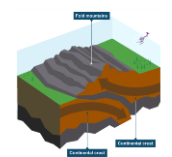
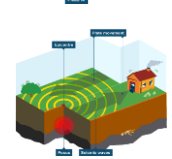
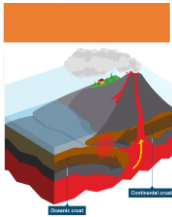
Global pattern of air circulation				Distribution of Droughts		Distribution of Tropical Storms.					
Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.						They are known by many names, including hurricanes (North America), cyclones (India) 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.					
Hadley cell	Largest cell which extends from the Equator to between 30° to 40° north & south.					<p>Normally, <u>warm ocean currents</u> off the coast of Australia cause <u>moist warm air</u> to rise and <u>condense</u> causing storms and <u>rain</u> over Australia.</p> 					
Ferrel cell	Middle cell where air flows poleward between 60° & 70° latitude.										
Polar cell	Smallest & weakest cell that occurs from the poles to the Ferrel cell.										
		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.			<h2>Topic 1</h2> <h1>Global Hazards</h1> <h3>Extremes in weather conditions</h3> <table><tr><td>Wellington, New Zealand Very high wind speeds (248mkm/h) due to the surrounding mountains funnelling wind.</td><td>Puerto Lopez Found along the equator, high temperatures lead to rapid condensation and heavy rainfall.</td></tr><tr><td>The Atacama, Chile The Andes mountains block moist warm travelling any further west. This causes rainfall to the east, but a rain shallow to the west.</td><td>Mawsynram, India This village see a lot of rain each year (11m per yr). This is due to the reversal of air conditions/directions from sea to land. In the summer, this contributes to monsoons.</td></tr></table>		Wellington, New Zealand Very high wind speeds (248mkm/h) due to the surrounding mountains funnelling wind.	Puerto Lopez Found along the equator, high temperatures lead to rapid condensation and heavy rainfall.	The Atacama, Chile The Andes mountains block moist warm travelling any further west. This causes rainfall to the east, but a rain shallow to the west.	Mawsynram, India This village see a lot of rain each year (11m per yr). This is due to the reversal of air conditions/directions from sea to land. In the summer, this contributes to monsoons.
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		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.								
High and Low Pressure			What is wind?								
High Pressure	Low Pressure		Wind is the movement of air from an area of high pressure to one of low pressure.								
Caused by cold air sinking. Causes clear and calm weather	Caused by hot air rising. Causes stormy, cloudy weather.										
Types of wind		Types of precipitation									
Katabatic Winds	Winds that carry air from the high ground down a slope due to gravity. e.g. Antarctic.	Convectonal Rainfall	When the land warms up, it heats the air enough to expand and rise. As the air rises it cools and condenses. If this process continues then rain will fall.								
Trade Winds	Wind that blow from high pressure belts to low pressure belts.	Frontal Rainfall	When warm air meets cool air an front is formed. As the warm air rises over the cool air, clouds are produced. Eventually steady rain is produced.								
Jet Streams	These are winds that are high in the atmosphere travelling at speeds of 225km/h.	Relief Rainfall	When wind meets mountains, the warm air is forced to rise quickly and cool. This leads condensation and eventually rainfall. When the air descend however, little very rainfall falls, creating a rain shadow.								
											
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.											
Changing pattern of these Hazards											
Tropical Storms	Scientist believe that global warming is having an impact on the frequency and strength of tropical storms. This may be due to an increase in ocean temperatures.										
Droughts	The severity of droughts have increase since the 1940s. This may be due to changing rainfall and evaporation patterns related to gradual climate change.										
Case Study: UK Heat Wave 2003											
		Causes									
		The heat wave was caused by an anticyclone (areas of high pressure) that stayed in the area for most of August. This blocked any low pressure systems that normally brings cooler and rainier conditions.,									
		Effects	Management								
		<ul style="list-style-type: none">People suffered from heat strokes and dehydration.2000 people died from causes linked to heatwave.Rail network disrupted and crop yields were low.	<ul style="list-style-type: none">The NHS and media gave guidance to the public.Limitations placed on water use (hose pipe ban).Speed limits imposed on trains and government created 'heatwave plan'.								
Case Study: Typhoon Haiyan 2013											
		Causes									
		Started as a tropical depression on 2 rd 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 destroyedWater 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		Types of volcanoes		Volcanic Hazards	
The Crust	Varies in thickness (5-10km beneath the ocean. Made up of several large plates.	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	Ash cloud	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
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.	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.	Gas	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
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.	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.	Lahar	A volcanic mudflow which usually runs down a valley side on the volcano.
Convection Currents				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.

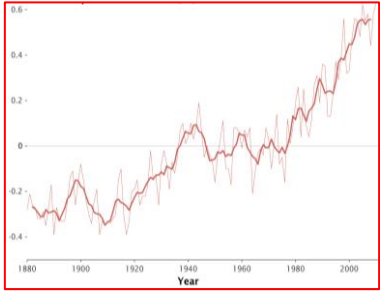


Managing Volcanic Eruptions		
Warning signs		Monitoring techniques
Small earthquakes are caused as magma rises up.		Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.		Thermal imaging and satellite cameras can be used to detect heat around a volcano.
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.
Earthquake Management		
PREDICTING		
Methods include: <ul style="list-style-type: none"> 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. 		

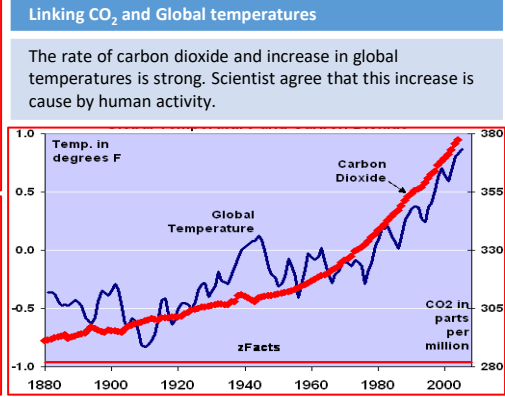
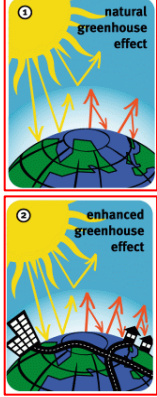
Types of Plate Margins		Causes of Earthquakes	
Destructive Plate Margin	When the denser plate subducts beneath the other, friction causes it to melt and become molten magma. The magma forces its ways up to the surface to form a volcano. This margin is also responsible for devastating earthquakes.	Earthquakes are caused when two plates become <u>locked</u> causing <u>friction</u> to build up. From this <u>stress</u> , the <u>pressure</u> will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of <u>seismic waves</u> , to travel from the <u>focus</u> towards the <u>epicentre</u> . As a result, the crust vibrates triggering an earthquake.	
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.	<div> <div> <p>The point directly above the focus, where the seismic waves reach first, is called the EPICENTRE.</p> <p>SEISMIC WAVES (energy waves) travel out from the focus.</p> <p>The point at which pressure is released is called the FOCUS.</p> </div> <div>  </div> </div>	
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 happening along the San Andreas Fault, USA.	Depth of Earthquake	
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.	<div> <div> <p>Shallow Focus</p> <p>-Usually small and common.</p> <p>-Seismic waves spread and damage wide area.</p> </div> <div> <p>Deep Focus</p> <p>-Occur on destructive margins.</p> <p>-Damage is localised as seismic waves travel vertically.</p> </div> </div>	
How do we measure earthquakes?			
Mercalli 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. 	Richter Scale	<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 <u>10 times greater</u> 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.	




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.




Evidence for climate change	
Earth's temperature has changed over the last 2.6 million years. Scientist 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 contractionary 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 scientist trapped oxygen isotopes. Scientist 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, scientist have calculated fluctuating temperatures of the atmosphere.
Historical records	Historical records from ancient cave paintings, diaries and written observations have provide evidence of climate change through personal accounts from the people through them.

Retreat of the Columbia Glacier, Alaska, USA
Located in southern Alaska, it flows 50km to the sea. The glacier has been retreated by 16km and has lost half of its thickness in the last 30 years. Scientists believed this is due to global warming, which if continued will contribute towards continued sea level rises.

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.

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. Produce from landfills, rice and farm animals.
Halocarbons	Human made and makes a tidy 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.

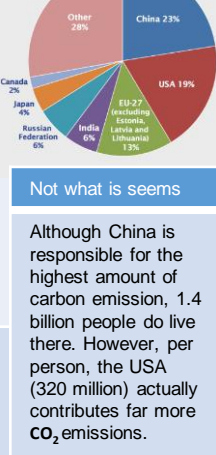
Whose responsible?



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.
	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.

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.



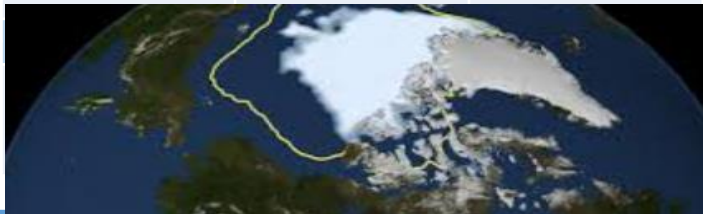
Not what it seems

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.

Rising Sea Levels: The Maldives and Isla de Jean Charles		
<p>The Maldives are a group of Atolls in the Indian Ocean. The average height of the Islands are 1.2m therefore are vulnerable to sea level rise.</p> <p>Isla de Jean Charles is located in Louisiana where a once vibrant community is now under water due to sea level rise.</p>		
Impacts from climate change		
Social	Economic	Environmental
In Isla de Jean Charles we have seen America's 1 st climate refuges. This is likely to also happen in The Maldives.	The Maldivian government have to pay for coastal defences. Tourism in the Maldives could be lost as the Atolls become flooded.	<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.










Melting Ice Caps: The Arctic circle		
In the Arctic circle, there is less ice today than there ever has been in recorded human history. We know this from Satellite images.		
Impacts from climate change		
Social	Economic	Environmental
Indigenous populations of the Arctic can no longer use the ice to catch fish or whales. This means that their traditional way of life has changed..	With less ice, more of the Arctic can be exploited for oil however this does mean that the ocean is more likely to be polluted from oil spills affecting the ecosystem.	Walruses have less ice to rest on, consequently they are more likely to become exhausted. It also means that 1000s gather and overcrowd what land is available causes further deaths.



Change is weather patterns		
<p>With a warmer climate comes the increased occurrence of drought across the world as well as more wildfires. It also means a more volatile atmosphere causing more storms and intense tropical storms like hurricanes.</p>		
Impacts from climate change		
Social	Economic	Environmental
More houses will get flooded as the chances of floods increase. Elderly populations will struggle with the extreme heat causing more elderly deaths.	Farmers struggle to grow crops due to increased drought meaning they reduce their yield.. Government have to spend more on healthcare for the elderly.	More wildfires across the globe mean that multiple habitats and ecosystems will be destroyed, reducing the biodiversity of the area.




Impacts of climate change on the UK.	Negative impacts of climate change for the UK			Positive impacts of climate change for the UK (remember to however your point)		
<p>The UK's climate is also changing. It is expected to...</p> <ul style="list-style-type: none">• Increase in average temperature.• Have warmer, but wetter winters.• Have warmer and drier summers.	Coastal Flooding		Extreme Rainfall		Tourism	
	<ul style="list-style-type: none">• Vulnerable low lying areas could flood homes and infrastructure.• Increase of coastal erosion.• Damage to the economy. 	<ul style="list-style-type: none">• Increase in extreme flash floods.• Flood damage to homes and businesses.• Soil contamination s on farmland. 	<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		
<p>However, not all the impacts to the UK will be negative, there are clear benefits for a changing climate.</p>	Water Shortages		Extreme Heat		Farming	
	<ul style="list-style-type: none">• Farmers will find it difficult to irrigate land.• Water restrictions, with London being worst affected. 	<ul style="list-style-type: none">• Warmer weather can increase health problems.• Infectious diseases such as malaria might spread. 	<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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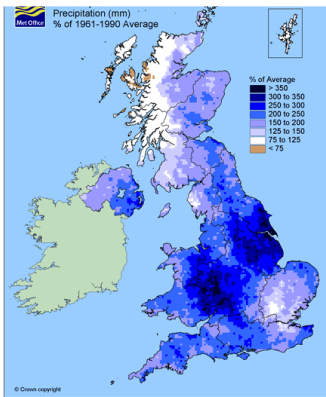
What is a landscape?		Relief of the UK		Erosion		Transportation	
A landscape has visible features that make up the surface of the land. Landscapes can be broken down into four 'elements'.		Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.		The break down and transport of rocks – smooth, round and sorted.		A natural process by which eroded material is carried/transported.	
Landscape Elements				Attrition	Rocks that bash together to become smooth/smaller.	Solution	Minerals dissolve in water and are carried along.
Physical <ul style="list-style-type: none">MountainsCoastlinesRivers	Biological <ul style="list-style-type: none">VegetationHabitatsWildlife			Solution	A chemical reaction that dissolved rocks.	Suspension	Sediment is carried along in the flow of the water.
Human <ul style="list-style-type: none">BuildingsInfrastructureStructures	Variable <ul style="list-style-type: none">WeatherSmellsSounds/Sights			Abrasion	Rocks hurled at the base of a cliff to break pieces apart.	Saltation	Pebbles that bounce along the sea/river bed.
				Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.	Traction	Boulders that roll along a river/sea bed by the force of the flowing water.






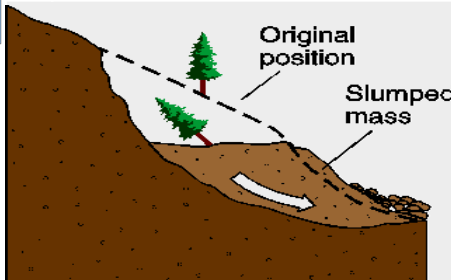
Areas +600m:
Peaks and ridges cold, misty and snow common. i.e. Scotland

Areas - 200m: Flat or rolling hills. Warmer weather. i.e. Fens

Glaciation in the UK			Human activity on Landscape		
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.			Farming has changed the vegetation which grows there.		Much of the rural landscape has been replaced by urban sprawls.
During the ice age			Over thousands of years, much of the UK's woodlands have gone.		Increasing population of the UK means more houses are needed.
Ice covered areas eroded and weathered landscapes to create dramatic mountain scenery.			UK's marshes and moorlands are heavily managed by people.		
After the ice age					
Deep valleys and deposition of sediment revealed					

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

Freeze-thaw weathering	
Stage One	Stage Two
Water seeps into cracks and fractures in the rock.	When the water freezes, it expands about 9%. This wedges apart the rock.
	
Stage Three	
With repeated freeze-thaw cycles, the rock breaks off.	



Original position

Slumped mass

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

Soil & Landscape	
<ul style="list-style-type: none">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

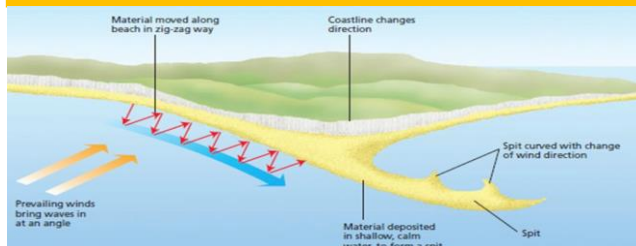
- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below –arch collapses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

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



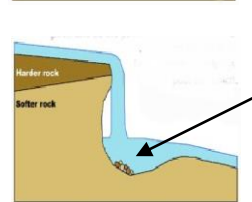
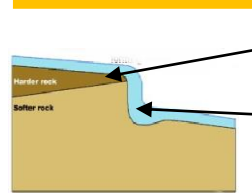
Example: Spurn Head, Holderness Coast

- 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



- 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.

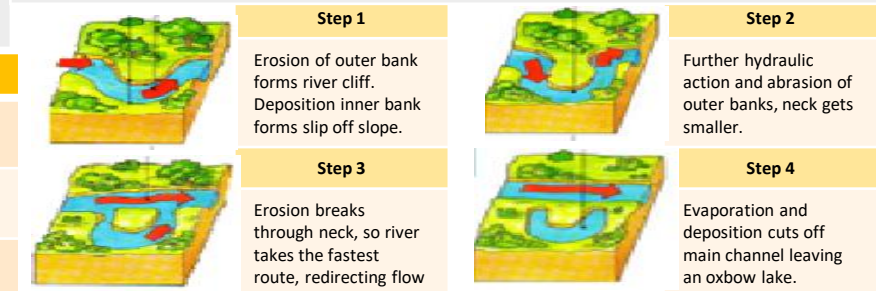
Formation of Floodplains and levees

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

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

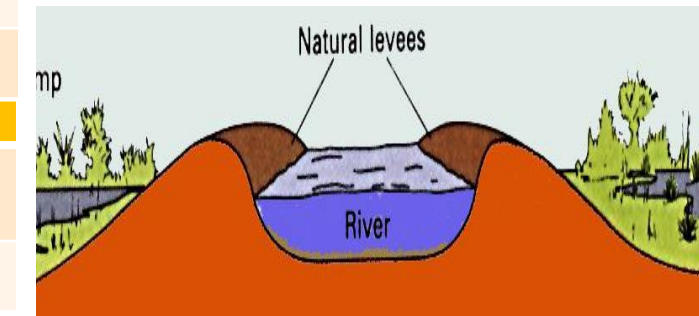
Middle Course of a River

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



Lower Course of a River

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



Case Study: The Dorset Coast: Old Harry Rocks to Swanage beach

Formation of landforms: Old Harry Rocks are a series of caves, arches and stacks made out of chalk. (see formation of coastal stack). The headland of the Foreland and the bay of Swanage bay were created due to their geology (see below)

How Geology affects the landforms: Where there is hard rock (chalk) the headland known as the Foreland is formed, this is because the chalk erodes more slowly. Where there is clay and sands Swanage bay is formed, this is because the erosion is more rapid.

How humans have affected the geomorphic processes: On Swanage beach 18 groynes attempt to reduce long shore drift and trap sediment on the sand. This protects the cliff behind it from the erosional power of the waves.

How climate can affect geomorphic processes: Storms in the winter increase the power of the waves and can cause the cliffs to collapse from mass movement. In winter freeze thaw weathering and salt cracking can weather Old Harry Rocks, causing it to weaken and be susceptible to mass movement.

Case Study: The River Tees

Formation of landforms: In the upper section High Force waterfall is made because of the geology of the rocks (see below). In the middle section geomorphic processes combine to form meanders and floodplains. (see diagrams above)

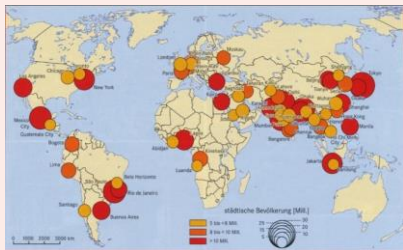
How Geology affects the landforms: At High Force Waterfall, Whinestone sits on top of Limestone. As the limestone is a weaker rock it erodes faster, creating a waterfall. (see diagram above)

How humans have affected the geomorphic processes: Cow Green Reservoir in the upper section of the river controls the flow (discharge) of the river. When more water is released there is more energy for erosion. The town of Yarm sits within a meander and so has created river defences (gabions and river walls) to stop erosion from altering the river course.

How climate can affect geomorphic processes: Winter months see more rainfall and so increase the level of water in the river. This causes more erosion to take place.

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. <ul style="list-style-type: none"> 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 with 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.
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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	Pull
<ul style="list-style-type: none"> Natural disasters War and Conflict Mechanisation Drought 	<ul style="list-style-type: none"> More Jobs Better education & healthcare Increased quality of life. Following family members.

Consequences of Rapid Urbanisation in LIDCs	
<p>Although there are lots of opportunities in urban areas, the rapid growth can place many pressures that causes various problems.</p>	Social Consequences <ul style="list-style-type: none"> Little official housing available. Infrastructure struggles to support growing population. Increase in crime rates.
Environmental Consequences	Economic Consequences
<ul style="list-style-type: none"> Rubbish may not be collected. Sewage and toxic waste pollutes river environments. Increased congestion produces more pollution. 	<ul style="list-style-type: none"> 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 city centres to the outskirts.	
Push	Pull
<ul style="list-style-type: none"> Overcrowding and pollution. Unemployment increases. Deindustrialisation of centre. Traffic congestion increases CO². 	<ul style="list-style-type: none"> 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	Pull
<ul style="list-style-type: none"> Overcrowding and pollution. Unemployment increases. Deindustrialisation of centre. Traffic congestion. 	<ul style="list-style-type: none"> Green spaces & family friendly. New modern housing estates. Improved public transport. Rents cheaper on outskirts.

Consequences of Suburbanisation

Environmental Consequences	Economic Consequences	Social Consequences
<ul style="list-style-type: none"> New housing damages countryside and habitats. Increase of cars adds air pollution. 	<ul style="list-style-type: none"> People leaves centres and they become deserted. Unemployment increases, which leads to poverty. 	<ul style="list-style-type: none"> Offices and businesses are abandoned. Economic and ethnic segregation.

Rapid Urbanisation: Life in Lagos, Nigeria		
		
Background		
Lagos is a port on the coast of Nigeria. Recently the city has experienced rapid population growth with 3.4 million extra people coming it home between 2000 and 2010.		
Effects of Urbanisation		
Social	Economic	Environmental
<ul style="list-style-type: none"> Many live without electricity. High diseases rate and life expectancy low. 	<ul style="list-style-type: none"> High rate of corruption to officials. Business is limited due to poor infrastructure. 	<ul style="list-style-type: none"> Large scale traffic issues. Slums such as Makoko are heavily polluted with poor sanitation.

Management
<ul style="list-style-type: none"> Authorities removed many dwellings in slums such as Makoko. A loan of \$200 from the World Bank to improve drainage and solid waste. New ideas such as the 'floating homes and school' have been suggested.





Re-urbanisation in ACs

This is the movement of people back into urban areas.	
Push	Pull
<ul style="list-style-type: none"> Lack of jobs in rural and suburban areas. Less leisure and entertainment in rural areas. Counter-urbanisation may have increased house prices. 	<ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> 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	Economic Consequences
<ul style="list-style-type: none"> Redevelopment of brownfield sites improves old industrial and polluted areas Decreases pressures on greenfield areas. Could destroy urban wildlife. 	<ul style="list-style-type: none"> New shops and services will improve local economy. Jobs available may not be accessible to original residents. Urban tourism may increase.

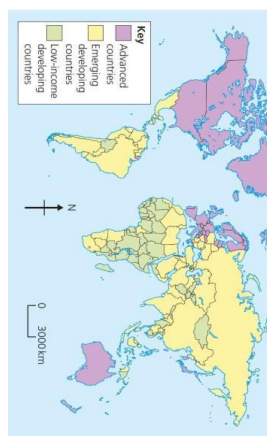
Informal Housing This is housing that is built on land which does not belong to those who are building it. This may be on land that is unsuitable due to its surroundings.		Greenbelt Area This is a zone of land surrounding a city where new building is strictly controlled to try to prevent cities growing too much and too fast.	
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.		Conurbation 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. <i>For example: Greater Manchester includes Manchester, Bolton, Oldham, Bury and Rochdale</i>	
AC: Challenges & Opportunities for Cities: LEEDS Case Study		EDC: Challenges & Opportunities for Cities: Istanbul Case Study	
Location and Background Leeds is the largest city in Yorkshire and the 3 rd largest in the United Kingdom. The city is at the heart of a conurbation which includes cities such as Bradford and Huddersfield.		Location and Background Istanbul as an extremely important location. It straddles Bosphorus strait which links the Black Sea to the Mediterranean sea and is where Asia meets Europe.	
			
City's Importance <ul style="list-style-type: none"> Has the fastest rate of job growth in the country. Third largest manufacturing centre in the UK, especially for clothing. Contains four 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. 		City's Importance <ul style="list-style-type: none"> Previously called Constantinople, it has been the capital of 3 major empires. (Roman, Byzantium and Ottoman) Its location means it is the gateway between Asia and Europe. It is both a mega city and a World City making it a very important city. Around one 5th of Turkey's population live in Istanbul. 	
Migration to Leeds Leeds began in Saxon times but developed into a major manufacturing location during the Victorian era of the 1800s. Now Leeds is a truly multicultural city with 17% being from black and other minorities communities.		Migration to Istanbul Traditionally it is rural to urban migration that has dominated Istanbul. Workers from less developed regions of Turkey migrated to Istanbul in search of work. Today there is more international migration, mainly from Syria. This can be classed as forced migration as people were forced from their homes in Syria due to war. The result is that Istanbul is now a multicultural city. Only 30% of the residents were born in Istanbul and the consequence is massive urban sprawl.	
<ul style="list-style-type: none"> Many commonwealth populations, such as India, 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. 		<ul style="list-style-type: none"> It is a busy city with many cultures. The Muezzin's call to prayer is an unmissable sign that Islam is significant. A modern and thriving nightlife with many bars shows a new future. Turks are incredibly proud of being Turkish, flags fly all through the city. 	
			
City Challenges <ul style="list-style-type: none"> 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. 		City Challenges Traffic congestion is the main issue in Istanbul. In 2014 it was named the most congested city in the world. The average speed at rush hour is 8kph causing commuters to spend an average of over 2 hours a day in their cars. This causes carbon emissions and stress during traffic, plus a reduction in productivity. The air pollution in the city exceeds WHO limits.	
South Bank Redevelopment The south bank area of Leeds is undergoing major development in the next decade. This will lead to...		A sustainable future? The integrated transport system where all transport types are linked together should reduce traffic on the roads. This includes the development of a rapid bus transport system. This should	
<ul style="list-style-type: none"> A new high speed railway line (HS2) is considered to run through Leeds. Retail and leisure services being supported. A new areas for contemporary arts. Educational improvements to Leeds College. Water taxis and bus services to cut down carbon emissions. 		<ul style="list-style-type: none"> reduce carbon emissions from cars Provide jobs now and in the future More time to work increasing productivity. Encourage walking to increase health and local coffee shops. 	

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.

Five stages of economic development.	1. Traditional society	2. Preconditions for take-off	3. Take-off	4. Drive to maturity	5. Mass Consumptions
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.	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	
LIDCs	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 LIDCs are in Africa. Remember, development can also vary within countries too.





Topic 6

Dynamic Development

Physical factors affecting development	
Natural Resources	Natural Hazards
<ul style="list-style-type: none"> Fuel sources such as oil. Minerals and metals for fuel. Availability for timber. Access to safe water. 	<ul style="list-style-type: none"> Risk of tectonic hazards. Benefits from volcanic material and floodwater. Frequent hazards undermines redevelopment.
Climate	Location/Terrain
<ul style="list-style-type: none"> Reliability of rainfall to benefit farming. Extreme climates limit industry and affects health. Climate can attract tourists. 	<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	Trade
<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. 	<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	Health
<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. 	<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	History
<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. 	<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 	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.
Trade 	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.
Political unrest 	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).
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. Their 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: Ethiopia

Location & Background

Ethiopia is a LIDC in the horn of Africa. A **landlocked** country surrounded by five countries. The **10th largest in Africa**, it has the second largest population with **94 million**. The capital is **Addis Ababa** with a population of 3.5 million.







Current level of development

- GNI per capita is **\$505** 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 **disease, poverty and political unrest**.
- HDI of **0.435** with **low life expectancy** at **63 years**.
- Country is **reliant on agriculture** with **89%** of all exports.
- Country receives **more imports** than exports.

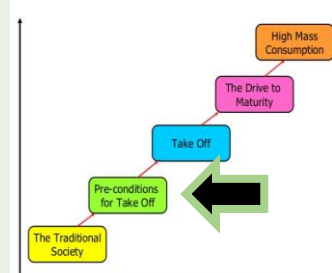


Influences upon Ethiopia's development

Political 	Social 	Physical 	Economic 
<ul style="list-style-type: none"> Ethiopia has suffered from various civil and military unrest. Derg government (1974-1987) killed thousands and terrorised people to cause many to migrate as refugee. Government is now stable since being a republic in 1991. 	<ul style="list-style-type: none"> 1984-85 famine killed a million people in just 1 year due to drought and high food prices. Growing population is causing a food deficient. People have a growing trust of the government but free speech is still limited. 	<ul style="list-style-type: none"> Rainfall in the country is unpredictable. This makes agriculture difficult. Inaccessibility, water shortages and infestations make valuable land difficult to farm. Drought affected areas has caused over-farming and desertification. 	<ul style="list-style-type: none"> Agriculture makes up most of the country's economy. Reliance on agriculture is vulnerable to climate change. Economy is now growing meaning fewer are in poverty. Income in the secondary & tertiary sectors are growing (particularly in tourism).

Ethiopia & Rostow's Model

- Despite the large primary industry, Ethiopia has improved education and healthcare due to investments from TNCs. As a result, Ethiopia is at stage 2.
- Better technologies & quality of life is allowing for pre Take off to emerge.



Millennium Development Goals

Set by the UN to set targets to reduce poverty.

+ Ethiopia is on track with primary education, reducing child mortality and healthcare.

- Malnutrition, gender equality, disease, global partnership and environmental sustainability is still a problem



Investment from TNC

A range of TNCs such as Siemens and Afriflora are now operating in Ethiopia at a primary, secondary and tertiary level.

+ Investment in infrastructure is increasing tourism.
+ Increase employment levels and people receive fair wages.

-Some TNC pay low salaries and working conditions are poor.
-TNCs sometimes take advantage of the unstrict regulations in place.

Aid & Debt relief

- 5 million people receive food aid from charities such as Oxfam and Farm Africa.
- Oxfam's Goat Aid is sustainable for young women.
- 'The Girl Effect' encourages equality & reduces birth rates.
- Wealthier countries encouraged the decline of the country's massive debt.
- Less debt repayments has meant more reinvestment.

Development strategy for Ethiopia

Bottom-up

This is led by local people and are known as 'grassroot' project.

+ Mission Aviation and Farm Africa have helped locals create sanitation, water systems, educate farmers and breed a livestock.

- Bottom-up approaches can be localized and depend on volunteers.

Top-down strategies

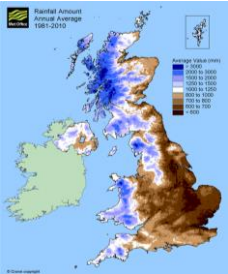
This is large scale investment at a national level.

+ \$3.6 billion has been spent converting rural mud roads into asphalt roads. Investment in HEP dams has produced a reliable source of energy.

- Local farmers have been evicted from HEP dam areas and water has become polluted.

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

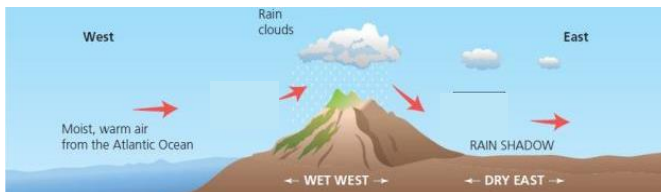
- Highest rainfall is in the north and west** where average rainfall is **2500mm**.
- Lowest rainfall is in the south and east** with average rainfall of **500 – 625mm**.

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

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%

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.

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

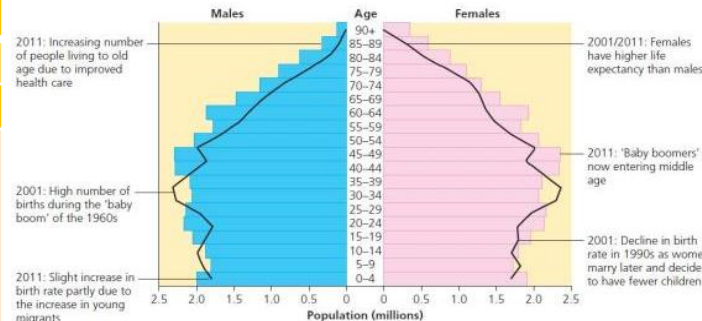
The UK population is 65 million and still rising. It is predicted to reach 70 million by 2030.

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

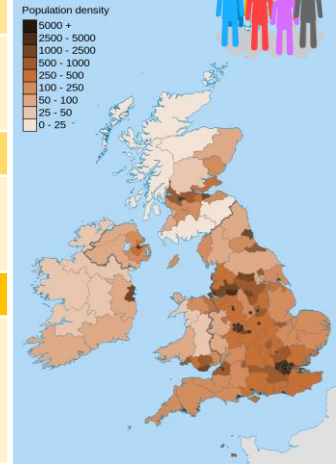
Much of Northern Scotland is **sparse** due to a **mountainous landscape and difficult climate**.

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.

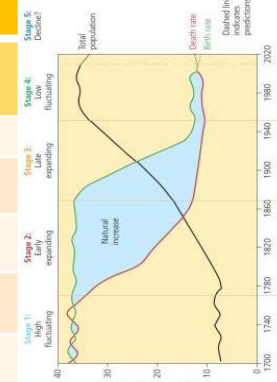
- Planning permission for new houses leads to **local opposition**.
- Green belt areas** prevents urban areas becoming bigger.
- The **price of lands keeps rising** due to demand.

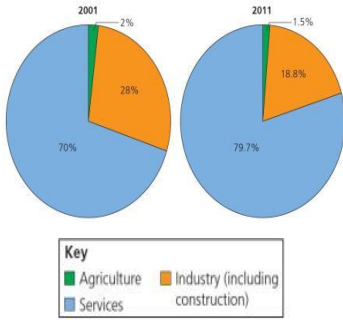












Demographic Transition Model (DTM)

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.





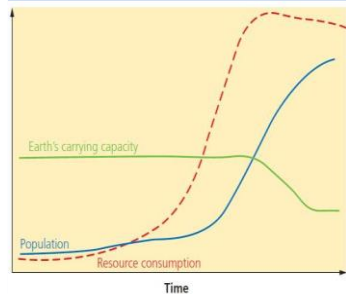
Ethnic Diversity in Bristol		UK Employment Sector		The UK's Role in the World							
<ul style="list-style-type: none">Bristol is a youthful city with 16-24 years old being the most common age range. This is due to the University and Bristol attracting jobs from that age range.The ethnic make up of Bristol remains mostly White British however this % is decreasing. The BAME population has doubled since 2001 from 6% to 12%. The majority of the BAME population live in or near the inner city.		<div>Key changes since 2001</div> <ul style="list-style-type: none">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. <div><div>Key<ul style="list-style-type: none">AgricultureIndustry (including construction)Services</div></div>		<div>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.</div> <table><tr><th>NATO</th><th>UN</th><th>G7</th></tr><tr><td><div>A group of 28 countries who work militarily and politically to resolve conflict as a last resort.</div></td><td><div>Is made up of 193 member states with the aim of maintaining peace and resolving issues. UK is part of the Security Council.</div></td><td><div>Involves seven of the wealthiest western countries to discuss relevant issues and come to economic agreements.</div></td></tr></table>		NATO	UN	G7	 <div>A group of 28 countries who work militarily and politically to resolve conflict as a last resort.</div>	 <div>Is made up of 193 member states with the aim of maintaining peace and resolving issues. UK is part of the Security Council.</div>	<div>Involves seven of the wealthiest western countries to discuss relevant issues and come to economic agreements.</div>
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UK Ageing Population		<div>Case Study: The UK in Resolving Conflict in Middle East</div>									
<div>Distribution of Ageing Population</div> <p>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.</p>		<table><tr><th>Basic Background</th><th>Success?</th></tr><tr><td>AS part of NATO, the UK joined forces with the USA to remove the Taliban from power in Afghanistan. This is because the NATO powers felt they were at threat from terrorism. Once the Taliban fell, the UK sent troops into Afghanistan to maintain peace and provide the Afghan government with support.</td><td>The UK forces did allow for the afghan government to set up new infrrstructure for the country however In 2021, the UK and US forces withdrew from Afghanistan and consequently the Taliban have regained control of the country.</td></tr></table>				Basic Background	Success?	AS part of NATO, the UK joined forces with the USA to remove the Taliban from power in Afghanistan. This is because the NATO powers felt they were at threat from terrorism. Once the Taliban fell, the UK sent troops into Afghanistan to maintain peace and provide the Afghan government with support.	The UK forces did allow for the afghan government to set up new infrrstructure for the country however In 2021, the UK and US forces withdrew from Afghanistan and consequently the Taliban have regained control of the country.		
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<div>Causes</div> <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.		<div>UK Working Hours</div> <ul style="list-style-type: none">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.									
<div>Effects</div> <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.		<div>UK's Core Economic Hubs</div> <p>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.</p> <div><div><div>Belfast Titanic Quarter Film studio, offices and education based on the old shipyard.</div><div>Salford Media industry including BBC and ITV. Manufacturing of chemicals.</div><div>Bristol Creative and digital industries. Key services such as law and finance.</div></div><div></div><div><div>Aberdeen Centre for the North Sea oil and gas industry, now developing as a research and development hub.</div><div>Silicon Glen High-tech industries based in key Scottish cities. They focus on electronics and software.</div><div>Silicon Fen High tech research hubs associated with Cambridge University.</div></div></div>									
<div>Response</div> <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.		<div>UK Involvement</div> <ul style="list-style-type: none">The UK, as part of NATO, sent troops and the RAF to neighbouring countries.In 2015, the UK gave £15 million in aid to Ukraine as well as military support.									
<div>UK's Changing Economy</div> <ul style="list-style-type: none">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.		<div>UK Media Exports</div> <table><tr><th>UK's Media's influences</th></tr><tr><td><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.</td></tr></table>				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.				
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<div>Political Changes</div> <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.		<div>Multicultural UK</div> <p>The UK is a multicultural country due to many ethic minorities moving here from India, Pakistan, Caribbean and parts of Africa. These groups have shared there culture and have influenced the UK in many ways especially in food</p> <div><div>Food</div><p>Food that has originated from other countries have become very established (i.e. and Pizza). Many mainstream supermarkets sell a great range of ingredients and ready made foods from other cultures. In Birmingham, the Balti triangle has become a famous tourist attraction known for serving the best Balti in the country. The Chicken Tikka Masala is a dish that combines the cultures of India and the UK (the dish was invented in Scotland)</p></div>									

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 	WATER 	ENERGY 
Without enough nutritious food, people can become malnourished . This can make them ill. This can prevent people working or receiving education.	People need a supply of clean and safe water for drinking, cooking and washing. Water is also needed for food, clothes and other products.	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 	2. Economic Development 
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 
<ul style="list-style-type: none"> 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 <u>NOT</u> 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

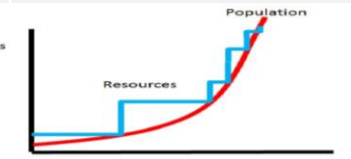
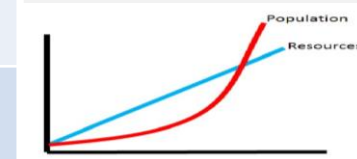
'**Food Security**' is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to '**Food Insecurity**' which is when someone is unsure when they might next eat.

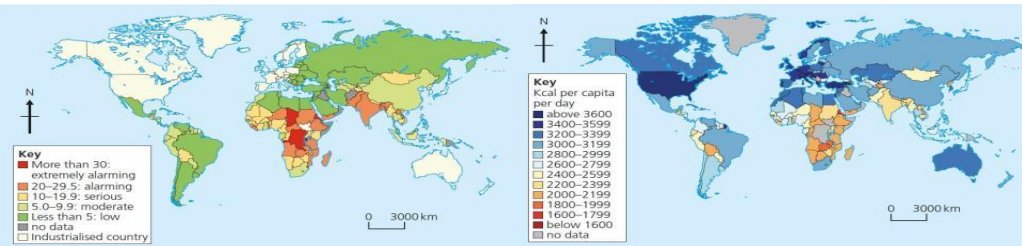





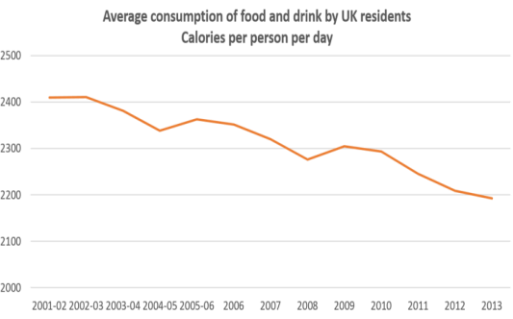

Human 	Physical 
<ul style="list-style-type: none"> Poverty prevents people affording food and farmers buying modern equipment. Poor infrastructure makes food difficult to transport fresh food. Conflict disrupts farming and prevents supplies. Food waste due to poor transport and storage. Climate Change is affecting rainfall patterns making food production difficult. 	<ul style="list-style-type: none"> 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	Boserup Theory
<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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	Social	Economic	Environmental
		Ethical Consumerism 		
<ul style="list-style-type: none">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 involves buying products that have a positive social, economic and environmental impact today, without compromising future generations.		
<ul style="list-style-type: none">This shows how many calories per person that are consumed on average for each country.This can indicate the global distribution of available food and food inequality,		Fairtrade <ul style="list-style-type: none">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.	<ul style="list-style-type: none">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. 	
		Food Waste		
		Food Production		
Case Study: UK Food Security 		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.		
Food Availability in the UK 	Food consumption in the UK	Intensive Farming <ul style="list-style-type: none">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 <ul style="list-style-type: none">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.	
	Success in securing local food security	Technological Developments		
Effectiveness of <u>past</u>s attempt at food security	Effectiveness of <u>present</u> attempts at food security	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.		
Intensification of farming from 1940s to the 1980s attempted to increase production by; <ul style="list-style-type: none">Higher yields of crops and animalsMonoculture by growing one crop in a large area.Irrigation with better groundwater pumping.Chemicals with improved fertilisers and pesticides.Mechanisation for sowing and harvesting.	Recently the UK has been promoting sustainable intensification, involving food security and supporting the environment. <ul style="list-style-type: none">New technology such as hydroponics help a range of foods to be grown all year round.However, this method is expensive for producer and consumer.	Genetically modified (GM) <ul style="list-style-type: none">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 <ul style="list-style-type: none">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.		
		Allotments <ul style="list-style-type: none">This is an area of land that is divided into plots and rented to individuals to grow their own fruit and vegetables.Allows people in urban areas to produce their own cheap & healthy food close to home.	<ul style="list-style-type: none">This involves people growing their own food and changing their eating habits.This can create more natural ecosystems and fewer resources are required.	
		Permaculture		

Stages of investigation		Sampling strategies					
To carry out an investigation you need to got through the following stages		Sampling allows us to collect data to try and prove/disprove our hypothesis. (this is because you can't measure all the areas). The larger the sample size the more reliable the data collection.					
1. Create a hypothesis	A hypothesis or question is a theory that you want to put to the test. Can you find data that supports or goes against this theory?				Systematic	This is where you take a measurement or a sample every set distance. (e.g. measure every 100m of the river).	This is easy to plan and to carry out but may miss some important areas.
2. Collect data	Here you use sampling techniques and data collection techniques to actually collect data that helps you prove or disprove your hypothesis or question of investigation.						
3. Present and analyse your findings	Use graphs to show what your data showed and then analyse the data using maths skills or words to express what the data shows.				Random	Random sampling removed bias. When deciding upon what rocks to measure you would remove 10 rocks from your location then use a random number generator to decide which rocks to measure.	This removed bias from your sampling as every item has an equal chance of being sampled but does require more organisation.
4. Write a conclusion	State whether or not you accept the hypothesis and then say why you accepted or rejected it.						
5. Evaluate the whole of your investigation	For each of the previous stages you can evaluate how successful the investigation was. What would you do differently next time?	Stratified	You make sure the samples reflects the categories that you are measuring.	This is more complicated to use and requires you to make sure that each category is sampled.			
Data collection type		Fieldwork	Opportunistic	You take the opportunity to sample wherever you can.			
Primary data			Secondary data				
This is data that you collect yourself. So it is up do date and relevant to your investigation but there may be problems with human error.			Secondary data is when you manipulate data from someone else or from another source (e.g. the internet. This can allow you to access more data but there are questions about the reliability of the data.				
Writing a conclusion			Data presentation				
When you write a conclusion you use the following format			Your choice of graph is important. Makes sure your data presentation is clear and can shows the patterns and trends of your data collection. The use of maps is really powerful here.				
1. State whether you accept or reject the hypothesis		Bar chart		Used when you collect discrete data			
2. Use data from the data presentation section to explain why you accept or reject the hypothesis. Make sure you clearly explain why.		Pie chart		Used when you have averages and multiple data sets			
		Proportional symbols		Data on a map. The size of the circle represents the amount and the location tells you where it was collected.			
		Cross section		These diagrams can show aspects such as the depth and width of rivers			
		Words clouds		Useful to help present findings from questionnaires. The words are the result of the questionnaire and the size of the word represents the importance.			

River Hypothesis
<p>A good hypothesis is a one that</p> <p>a) Has a geographical nature</p> <p>b) Has a suitable scale so that it can be easily measured</p>
Examples of hypothesis for a rivers investigation
<ul style="list-style-type: none"> The river is faster on the outside of the meander The river gets wider/deeper/faster as it travels from source to mouth. The pebbles get smaller as the river travels from source to mouth.

Risk assessment: Rivers
<p>Prior to a river investigation it is essential to carry out a risk assessment to avoid injury or death.</p>

Check the depth and speed of the river	As river heights vary due to rainfall it is important to assess the speed and the depth of the river. If it is too high or too fast then post-pone the investigation to another day.
Getting overly wet	Naturally a river investigation will involve you getting wet but this can be mitigated through wearing waders or wellington boots.
Reduce chance of injury	Making sure that people move safely and calmly while in the river and can access the river at safe points.

Urban hypothesis
<p>A good hypothesis is a one that</p> <p>a) Has a geographical nature</p> <p>b) Has a suitable scale so that it can be easily measured</p>
Examples of hypothesis/questions for an urban investigation
<ul style="list-style-type: none"> How does the environmental quality vary as you walk from the city centre to suburbs? What extent is there deprivation in the city centre? Do different ages have different views about their town? How sustainable is a recent development in your town?

Data collection techniques: Rivers	
Investigation on pebble size	At chosen points in a river, collect 10 pebbles from 1 metre into the river from the bank. Use a random number generator to choose 3 rocks and measure the width and height them using a calliper. Once done you can then create an average.
Investigation on river velocity (speed)	Measure a 10 metre stretch of water. Place an orange at the start point and time how long it takes to travel 10 metres. Then calculate the speed. Repeat the process at least 3 times to increase reliability.
Investigation about river depth	<ol style="list-style-type: none"> Measure the width of the river using a tape measure. Use systematic sampling to measure the depth at 5 regular intervals by placing a metre ruler into the river and measuring the height of the river.

Fieldwork: Rivers and Urban areas

Data collection techniques: Urban	
Investigation on traffic	Complete a traffic survey, counting the various types of vehicles on the road at different times of the day. Take photographs of traffic at different times of the day. Count bike racks and look at regularity of busses. Complete a questionnaire on people views
Investigation on deprivation or environment	Complete a environmental survey (bi-polar survey) on the area. Complete a questionnaire on people views
Investigation about sustainability of the area	Complete an environmental survey. Complete a questionnaire on people opinions. Complete a traffic survey Complete a footfall survey to see how busy the areas is.