

Year 11 Geography Curriculum Overview 2024

4 hours per two weeks

	Autumn		Spring 1	Spring 2	Summer
<b>Masterclass provision:</b> <i>given during morning meeting to the full yr11 cohort</i>	<b>Autumn 1</b> Hazards revision	<b>Autumn 2</b> Living world (new content)	Resource management revision	Changing economic world – revision of Nigeria case study, new content – the UK economy	The physical landscape of the UK revision
	<b>Paper 2 – Urban Issues and Challenges</b>		<b>(1) Mocks – students will sit exams in all three papers</b> <b>(2) Changing economic world: UK economy</b>	<b>Revision: Living World &amp; Physical landscape of the UK</b>	<b>Pre-release preparation</b>
Overview of Scheme of Learning	Students will study a range of urban environments, with a focus on Rio de Janeiro and Bristol as major case studies, representing a city in a Newly Emerging Economy (Rio) and a city in a High-Income Country (Bristol). The content will focus on challenges (problems of urban growth) and opportunities presented by urban growth.		Students will study changes to the UK economy as part of the changing economic world unit. Topics covered will include the north-south divide, deindustrialisation and strategies to increase economic activity such as science parks, business parks and enterprise zones.	Students will identify gaps in their learning and focus on key content and skills that need revisiting before the final examinations. Structured revision tasks will assist in closing these gaps.	Students will study the pre-release provided by the exam board for the paper 3 exam. The pre-release consists of a booklet of information on a particular geographic issue. In the paper 3 exam, students will be required to use the knowledge gained to answer a series of questions on the issue and ultimately make a decision about what the outcome should be.
Assessment Overview	<b>Pre-assessments</b> on the following: Evaluate to what extent economic development has improved the quality of people’s lives in Nigeria. [6 marks]		<b>Assessments:</b> Will include mock exams on all three papers, followed by DIRT activities to help students	<b>Pre-assessments</b> on the following human geography topics, plus one physical geography topic to assist	<b>Final examinations – Paper 1, 2 and 3</b>

	<p>Explain how Nigeria’s rapid economic growth can have harmful impacts on the environment. [6 marks]                  Explain how an urban planning scheme in an LIC or NEE has aimed to improve the quality of life for people in squatter settlements (6)                  For one of your geography enquiries, to what extent were results of this enquiry helpful in reaching a reliable conclusion(s)? 9 marks (+3 SPaG marks)</p>	<p>close knowledge gaps and practise exam technique.                   Urban end of topic assessment, including a range of lower and higher tariff GCSE questions.</p>	<p>students in preparing for the final exams:</p> <ul style="list-style-type: none"> <li>• Urban environments</li> <li>• Changing economic world – the UK economy</li> <li>• Coasts (process question)</li> </ul>	
<p>Cultural capital</p>	<p><b>Read</b> – How Population Change will Transform our World, by Sarah Harper.   <b>Rio</b> –  <b>Watch</b> - <a href="#">Inside Rio's favelas video</a>  <b>Read</b> – Brazil, by Michael Palin.  <b>Watch</b> – Welcome to Rio  <b>Read</b> - Rio de Janeiro: Extreme City, by Luiz Eduardo Soares  <b>Read</b> - <a href="https://www.bbc.co.uk/news/world-latin-america-27635554">https://www.bbc.co.uk/news/world-latin-america-27635554</a>   <b>Bristol</b> –  <b>Read</b> - How is Bristol’s population structure changing?  <a href="https://thebristolcable.org/2016/04/booming-bristol/">https://thebristolcable.org/2016/04/booming-bristol/</a></p>	<p><b>Explore</b> <a href="#">The Global Food security index</a>                  Select a country, change the graph axis to compare GDP. What can you learn about the UK and Nigeria?   <b>Explore</b> <a href="#">The Global Economy</a> Select countries and indicators to create your own graphs. What can you learn about the UK and Nigeria?   <b>Read</b> “Global Economy as You’ve Never Seen it, The 99 Ingenious Infographics That Put It All Together” by Tomas Ramage.</p>	<p><b>Ecosystems</b>  <b>Visit</b> a local ecosystem e.g. river, pond, hedge, garden, woodland. Which animals do you see? Can you create a food web? How is this ecosystem threatened and how is it managed?   <b>Grow or plant</b> seeds/sapplings.   <b>Watch and sketch</b> an animal in your garden/local park. How does it interact with its surroundings?   <b>Tropical rainforests</b>  <b>Research</b> deforestation on the BBC News</p>	<p>This will depend upon the topic of the pre-release.   <b>Watch</b> video clips on the topic covered by the pre-release.   <b>Read</b> newspaper articles on the topic covered by the pre-release.                   Your teacher can suggest some materials for you once the pre-release has been issued.</p>

	<p><b>Explore</b> this interactive choropleth map showing deprivation levels in the UK. Can you find Bristol?  <a href="http://dclgapps.communities.gov.uk/iod/iod_index.html">http://dclgapps.communities.gov.uk/iod/iod_index.html</a></p> <p><b>Explore</b> – explore the data about Filwood.  <a href="https://www.bristol.gov.uk/documents/20182/436737/Filwood.pdf/d2f649ea-424e-4f36-a739-f93c79d6c40a">https://www.bristol.gov.uk/documents/20182/436737/Filwood.pdf/d2f649ea-424e-4f36-a739-f93c79d6c40a</a>          And compare to Stoke Bishop.  <a href="https://www.bristol.gov.uk/documents/20182/436737/Stoke+Bishop.pdf/0be3a2c1-4235-4db8-abe2-b457c8da63b2">https://www.bristol.gov.uk/documents/20182/436737/Stoke+Bishop.pdf/0be3a2c1-4235-4db8-abe2-b457c8da63b2</a></p>	<p><b>Read</b> <a href="#">The Economy of the United Kingdom</a></p>	<p><b>Watch</b> “Our World. Selling the Amazon.” On iPlayer</p> <p><b>Watch</b> – Planet Earth 2, Episode 3 – Jungles on iPlayer</p> <p><b>Read</b>  <a href="#">The man who planted a tree article.</a></p> <p><b>Hot deserts</b>  <b>Research</b> desertification on the BBC News</p> <p><b>Watch</b> – Planet Earth, Episode 5 – Deserts on iPlayer</p> <p><b>Read</b> – about the Great Green Wall  <a href="https://news.globallandscapeforum.org/46781/the-great-green-wall-is-officially-4-and-unofficially-18-complete/">https://news.globallandscapeforum.org/46781/the-great-green-wall-is-officially-4-and-unofficially-18-complete/</a>   <a href="https://www.smithsonianmag.com/science-nature/great-green-wall-stop-desertification-not-so-much-180960171/">https://www.smithsonianmag.com/science-nature/great-green-wall-stop-desertification-not-so-much-180960171/</a></p>	
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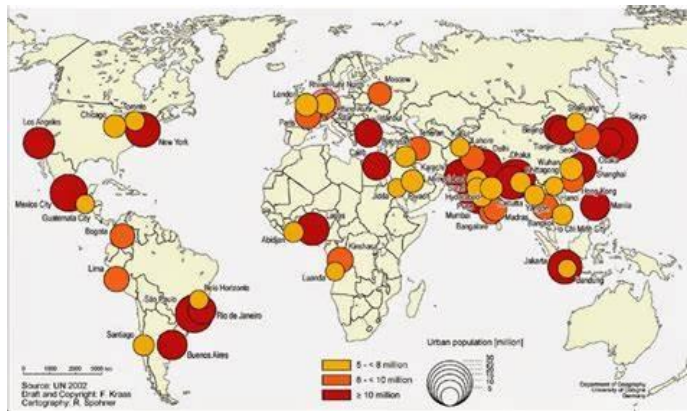
				<p><b>Watch</b> – Planet Earth 2, Episode 4 – Deserts on iPlayer</p> <p><b>Coasts</b></p> <p><b>Visit</b> a local beach, for example, Cromer, Southwold or Great Yarmouth. What landforms can you see? Is there any evidence of management?</p> <p><b>Watch</b> an episode of “Coast” on iPlayer</p> <p><b>Watch</b> “Blue Planet” on iPlayer</p> <p><b>Explore and read</b> articles by The Natural History Museum - <a href="https://www.nhm.ac.uk/discover/oceans.html">https://www.nhm.ac.uk/discover/oceans.html</a></p>	
Link to detailed content	<p><i>Knowledge organiser</i></p> <p>1. Urban</p>	<p><i>Knowledge organiser</i></p> <p>1. Urban</p>	<p><i>Knowledge organiser</i></p> <p>2. Changing economic world</p>	<p><i>Knowledge organiser</i></p> <p>3. Living world</p> <p>4. Rivers and coasts</p>	<p><i>OUP - GCSE 9-1 Geography AQA Revision Guide</i></p> <p>ISBN - 0198423462</p>

**KEY IDEA: A growing percentage of the world's population lives in urban areas.**

### What is urbanisation?

This is an increase in the proportion of people living in urban areas such as towns or cities. Today, 55% of the world's total population live in urban areas.

A **megacity** is a city with 10 million+ people. In 2015 there were 28. By 2050 there are expected to be 50. There are three types of mega-city: slow-growing, e.g. Los Angeles; growing, e.g. Rio de Janeiro; and rapid growing, e.g. Mumbai.



Cities grow in two ways, by **migration**, the permanent movement of people into or out of the city, or by **natural increase**, the difference between the number of births and the number of deaths.

Urbanisation is happening more quickly in **NEEs** and **LICs** than HICs. This is mostly because of the rapid economic growth NEEs and LICs are experiencing.

**Rural-urban migration** is the movement of people from rural to urban areas. They move because of **push factors**, which encourage people to leave an area (e.g. war, drought, lack of employment) and **pull factors**, which attract people to an area (e.g. more jobs, better education and healthcare).

**KEY IDEA: Urban growth creates opportunities and challenges for cities in LICs and NEEs**

### Urban change in a major NEE city: Rio de Janeiro



Rio has **international importance**, e.g. it is a major international hub and has 5 ports and 3 airports. It has **national importance**, e.g. it produces 5% of Brazil's GDP as Brazil's 2<sup>nd</sup> most important industrial centre; and it has **regional importance**, e.g. it provides employment in

service and manufacturing industries.

### Challenges in the Human Environment: Urban issues and challenges

Rio has **grown** to become a major industrial, administrative, commercial and tourist centre. These economic activities have attracted migrants from Brazil and other countries to increase the city's population. Migrants largely come from other parts of Brazil and other countries in South America.

Rio has mountains, coast and large squatter settlements. The city is divided into zones: **Centro** (centre – the oldest part of the city with the Central Business District and main shopping area); **South Zone** (wealthy, with luxury flats, has the main tourist area and beaches); **West Zone** (becoming a wealthy coastal suburb, but also industrial, with low-quality housing); and **North Zone** (main industrial and port area, also has favelas).



**Urban growth has created opportunities, and its industrial area created economic growth. But, there are challenges.**

The authorities have tried solving the **social challenges**:

**Health care** – in 2013 only 55% of the city had a local family health clinic. To help, medical staff took a health kit into people's homes in the Santa Marta favela. As a result, infant mortality has fallen and life expectancy increased.

**Education** – In Rio, only half of children continue their education beyond 14, and many become involved in gangs. The authorities have given school grants to poor families, and opened a university in Rocinha favela.

**Water supply** – Approximately 12% of Rio's population did not have access to clean water. New water treatment plants were built, and 300km+ of pipes were laid. By 2014, 95% of the population had a mains water supply.

**Energy** – The whole city has frequent blackouts due to a shortage of electricity. Improvements include 60km of new power supply lines, a new nuclear energy generator, and a hydro-electric complex.

Brazil's **economy** suffered recession in 2015, which widened Rio's inequalities. Unemployment in Rio's favelas is over 20% and most people work in the **informal economy**. These jobs are low paid and money is irregular; they do not offer benefits or insurance. Informal sector workers do not pay tax, reducing the Government's income for healthcare and education. These economic problems and poor quality of life push many of Rio's young into gangs – which, in turn, becomes an economic problem as businesses are deterred from moving into Rio because of the high crime rates.



Rio has many **environmental** challenges, which affect its people's quality of life. These challenges are created by the physical geography, as well by human activities. **Physical** problems include communication between parts of the city across the bay; mountains limit spaces for building; algae blooms and eutrophication in the Lagoa Rodrigo Channel; and many squatter settlements built on steep hillsides are prone to landslips. Problems caused by **human** activity include pollution in the bay due to urbanisation and poor industrial practices; dereliction due to de-industrialisation; extensive urban sprawl; and smog caused by traffic.



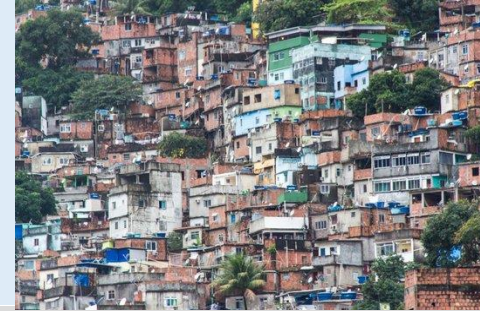
**Air pollution** causes about 5,000 deaths per year in Rio. To help, solutions have been aimed at reducing **traffic congestion**: the metro system has been expanded; there are new toll roads into the city to reduce congestion; and coast roads are made one-way during rush hour, to improve flow. Solutions for **water pollution** in Guanabara Bay include 12 new sewage works built since 2004 at a cost of US\$68 million. Ships are now fined for discharging fuel into the bay illegally, and 5km of new sewage pipes have been built. **Waste pollution** is a major problem in the favelas. Most waste is dumped, which pollutes the water system, causes disease and encourages rats. A power plant has now been set up using biogas from rotting rubbish. It consumes 30 tonnes of waste a day and produces electricity for 1,000 homes.

**The favelas are illegal settlements where people have built homes on land that they did not own.**

There are up to 1,000 favelas in the greater Rio area.

**Rocinha** is the largest favela in Rio. It is built on very steep hillsides and is close to wealthy areas of the city where many of Rocinha's inhabitants work. As many of the people have work, they are able to make improvements to Rocinha.

This favela has: 90% brick houses, with electricity, water and sewerage; retail facilities including a McDonalds; schools, health facilities and a private university.



**Challenges of squatter settlements**, include: **poor construction** – houses are badly built with waste materials. Many favelas are on steep slopes and heavy rain can cause landslides. **Services** – where favelas have not been improved, around 12% of homes do not have running water, over 30% no electricity, and about 50% no sewerage. **Unemployment** is

#### The favelas of Rio de Janeiro



a big problem, which also pushes people into **crime** – there is a murder rate of 20 per 1,000 people in many favelas, which are dominated by drugs gangs. **Health** services are under great pressure – there are population densities of 37,000 per km<sup>2</sup>, and infant mortality rates are 50 per 1,000 live births.

**Urban planning is improving the quality of life for the urban poor.**

Until 1980, the authorities did not acknowledge the favelas. But now, improvements are being made. In the mid-1980s, city planners decided to make changes to help the urban poor, such as rehousing favela residents into basic housing and cultural opportunities like samba for the young.

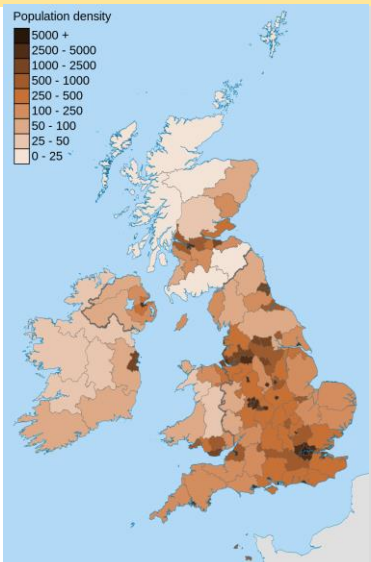
The **Favela Bairro Project** is a good example of how planning can improve the lives of the urban poor. The local authority provides land and services and the residents can build their own homes, e.g. Complexo do Alemão is a group of favelas in the North Zone with 60,000+ residents. Improvements made by the Favela Bairro project include: paved roads; water supply and drainage; hillsides secured to prevent landslides; new health facilities; and a Pacifying Police Unit (UPP) to help reduce crime.



However, there are remaining problems with the Favela Bairro Project: the budget may not cover all favelas; new infrastructure is not being maintained; residents lack materials for repairs; and rents have risen in some favelas.

Some favelas were demolished to make way for the **Olympic Games** in 2016. Some residents were forcibly moved. Eight hundred new houses were built in Campo Grande in the West Zone for people whose favela homes were demolished, and conditions have improved for some. However, Campo Grande is a long way from the city, reducing opportunities for work.

**KEY IDEA: Urban change in cities in the UK leads to a variety of social, economic and environmental opportunities and challenges**



**UK population** in 2015 was 64.6 million, with 82% living in urban areas. The UK's **urban areas** reflect its industrial past, so major urban areas are located near to supplies of coal and raw materials. In modern UK, more people live in south-east England and London; a financial, business and cultural centre. Since 1997 annual immigration to the UK has been greater than emigration. Migrants usually settle in cities for the job opportunities.

However, there is also movement away from urban areas as people choose to live in coastal / rural areas.

**Urban change in the UK: Bristol**

Bristol is the largest city in the south west of England. It has **international, national and regional** importance. Bristol's importance is due

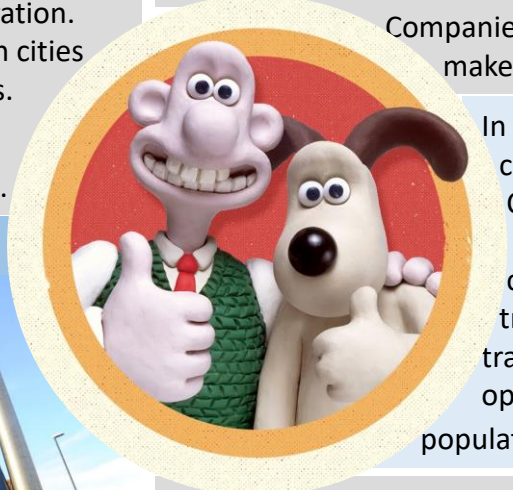


to two universities, high-tech industry; tourism; culture; and two cathedrals. Recently, immigration accounts for about half of Bristol's population growth. Migrants bring many benefits, e.g. a larger workforce and skilled workers who contribute to the local and national economy, and bringing proportionally more young people into the city. However, migrants also bring challenges, such as pressures on housing and employment; education; and integration into the community.

Urban change in Bristol has created **social opportunities**, including cultural and sporting opportunities. **Cabot Circus**, a £500 million development, opened in 2008 with shops, leisure facilities, and 250 apartments. **Bristol's Harbourside** is part of a project to regenerate the centre of the city; where former warehouses have been converted into cultural venues.

Urban change in Bristol has created **economic opportunities**. Recent developments have been in the **tertiary** (services) and **quaternary** (high tech and knowledge based) **sectors**. A number of factors attract high-tech businesses to Bristol: a government grant of £100 million for high tech development; broadband speeds of at least 80Mbps; close links between the council and university; an educated and skilled workforce; and a clean and pleasant environment to attract workers.

Companies based in Bristol include Aardman, makers of Wallace and Gromit.



In 2015 Bristol became the first UK city to become a European Green Capital. It has an **Integrated Transport System (ITS)**, which connects different methods of transport to encourage public transport use. Over a third of Bristol is open space, and 90%+ of the population live within 350m of parkland.

**Environmental challenges** in Bristol include the **dereliction** of disused industrial buildings, and urban sprawl due to demand for housing. **Stokes Croft** is a former industrial inner city area, which has been successfully improved. **Gentrification** is now a risk in this area, meaning that people may no longer be able to afford to live there. **Urban sprawl** has occurred as families move to new housing estates on the outskirts of the city, particularly to the north-west. Bristol is prioritising the development of **brownfield sites** to address urban sprawl, such as Finzels Reach.

Bristol produces the lowest amount of **waste** per person of any UK city, but the city still produces over half a million tonnes of waste a year. Bristol's household waste has reduced by 18% since 2000. This has been done by education; increasing kerbside collections of recyclables; and technological improvements in recycling. Some of the waste is used to generate electricity.

**Vehicle emissions** are the main source of air pollution in Bristol; and Bristol is the most congested city in England. Steps being taken to reduce air pollution include the ITS; reducing speed limits; and electrical vehicle charging points. Bristol's "Poo Bus" will run on bio-methane gas from human and food waste!



In some areas of Bristol there are significant **social inequalities**. For example, **Filwood** is in the top 10% of

the most socially deprived areas in the country. In Filwood, life expectancy is 78 years. By contrast, **Stoke Bishop** is an affluent suburb, where life expectancy is 83 years. Significant **housing pressure** and Government policy have led to building on greenfield sites, for example the new town of **Harry Stoke**, which has around 3,200 new homes. However, Bristol does have a good record for building on brownfield sites; between 2006 and 2013 94% of new housing was built on brownfield sites, including **Bristol Harbourside**.

The **Temple Quarter** area was a former industrial area from the 18<sup>th</sup> century. Its **urban regeneration** included improvements to Temple Meads Station; development of Brunel's Engine Shed for high-tech and creative businesses; and the Glass Wharf, a new office development.

**KEY IDEA: Urban sustainability requires management of resources and transport.**

**Sustainable development** is widely defined as “development that meets the needs of the people today without compromising the ability of future generations to meet their own needs”.

**Sustainable urban planning: Freiburg**

**Freiburg**, Germany, is one of the world’s most sustainable cities after the city set a goal of **urban sustainability** in 1970.

**Social planning** takes into account people’s needs. In Freiburg, local people are involved in urban planning.

**Economic planning** is to provide employment, and 10,000+ people in Freiburg are employed in 1,500 environmental businesses.



**Environmental planning** ensures that resources are not wasted and are protected for the future. Waste is reduced by re-using and recycling materials. Freiburg has reduced annual waste disposal from 140,000 to 50,000 tonnes in 12 years.



**Vauban** is an inner city district built on a former army barracks. It houses 5,500 people in low-energy buildings, and green roofs collect and reuse rainwater.

**Sustainable water supply** in Freiburg is maintained by collecting and recycling water. There are financial incentives for people to use water sustainably; and unpaved areas, including some tramways, are used to allow rainwater to seep back into the ground.



Freiburg’s energy policy is intended to achieve a **sustainable energy supply**, and Freiburg plans to achieve 100% renewable energy by 2050. There are around 400 solar panel installations in the city, producing around 10 million kilowatts per year from solar energy. Freiburg also takes renewable energy from biomass using waste wood and rapeseed oil. Biogas is also produced from organic waste (e.g. food waste). However, in 2015 only 3.7% of Freiburg’s electricity was from locally generated, renewable resources.

**Green spaces** help keep air pollution down and also protect the city from flooding. Flood retention basins provide flood storage within the Black Forest, and the excess water can be used in the city. In total 40% of Freiburg is forested.

**Sustainable traffic management**

**Freiburg** has an integrated traffic plan (ITP) updated every 10 years. A key part is the tram network, which provides cheap and accessible public transport, e.g. 70% of the population live within 500m of a tram stop. There are also 500 km of cycle paths with 9,000 bike parking spaces; and restrictions on car parking spaces. As a result, tram journeys have increased by over 25,000 in a year, while car journeys decreased by nearly 30,000.



**Singapore**, in southeast Asia, is a small island state. Traffic

policies include: high petrol prices; financial incentives for using cars only at weekends; and development of an overhead railway system and efficient bus network.

There is now 45% less traffic, and 25% fewer accidents.



**Beijing** is China’s capital, with about 5 million cars. Strategies to reduce congestion include: improved public transport; increased parking fees; and restrictions on car use. The strategies have led to a 20% drop in car use.



## What is development?

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

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

## Measuring development

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



### Economic indicators examples

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

### Social indicators examples



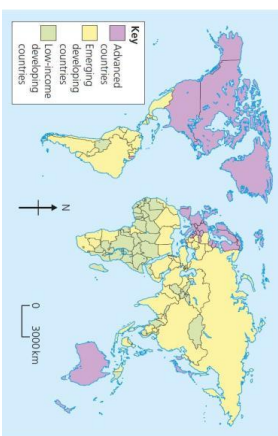
<b>Infant mortality</b>	The number of children who die before reaching 1 per 1000 babies born.
<b>Literacy rate</b>	The percentage of population over the age of 15 who can read and write.
<b>Life expectancy</b>	The average lifespan of someone born in that country.

### Mixed indicators

<b>Human Development Index (HDI)</b>	A number that uses life expectancy, education level and income per person.
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## Variations in the level of development

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



## Causes of uneven development

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

## Unit 2b



# The Changing Economic World

## Physical factors affecting uneven development

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

## Human factors affecting uneven development

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

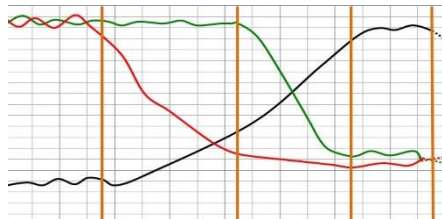
## Consequences of Uneven Development

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

<b>Wealth</b>	People in more developed countries have higher incomes than less developed countries.
<b>Health</b>	Better healthcare means that people in more developed countries live longer than those in less developed countries.
<b>Migration</b>	If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living.

## The Demographic Transition Model

The demographic transition model (DTM) shows population change over time. It studies how birth rate and death rate affect the total population of a country.



STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
High DR High BR Steady	BR Low Declining DR Very High	Rapidly falling DR Low BR High	Low DR Low BR Zero	Slowly Falling DR Low BR Negative
e.g. Tribes	e.g. Kenya	e.g. India	e.g. UK	e.g. Japan

## Reducing the Global Development Gap

### Microfinance Loans



This involves people in LICs receiving smalls loans from traditional banks.

- + Loans enable people to begin their own businesses
- Its not clear they can reduce poverty at a large scale.

### Foreign-direct investment



This is when one country buys property or infrastructure in another country.

- + Leads to better access to finance, technology & expertise.
- Investment can come with strings attached that country's will need to comply with.



### Debt Relief

This is when a country's debt is cancelled or interest rates are lowered.

- + Means more money can be spent on development.
- Locals might not always get a say. Some aid can be tied under condition from donor country.

### Aid

This is given by one country to another as money or resources.

- + Improve literacy rates, building dams, improving agriculture.
- Can be wasted by corrupt governments or they can become too reliant on aid.



### Fair trade



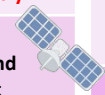
This is a movement where farmers get a fair price for the goods produced.

- + Paid fairly so they can develop schools & health centres.
- Only a tiny proportion of the extra money reaches producers.

### Technology

Includes tools, machines and affordable equipment that improve quality of life.

- + Renewable energy is less expensive and polluting.
- Requires initial investment and skills in operating technology



## CS: Reducing the Development Gap In Jamaica



### Location and Background



Jamaica is a LIC island nation part of the Caribbean. Location makes Jamaica an attractive place for visitors to explore the tropical blue seas, skies and palm filled sandy beaches

### Tourist economy



- In 2015, 2.12 million visited.
- Tourism contributes 27% of GDP and will increase to 38% by 2025.
- 130,000 jobs rely on tourism.
- Global recession 2008 caused a decline in tourism. Now tourism is beginning to recover.

### Multiplier effect

- Jobs from tourism have meant more money has been spent in shops and other businesses.
- Government has invested in infrastructure to support tourism.
- New sewage treatment plants have reduced pollution.

### Development Problems

- Tourists do not always spend much money outside their resorts.
- Infrastructure improvements have not spread to the whole island.
- Many people in Jamaica still live in poor quality housing and lack basic services such as healthcare.

## Case Study: Economic Development in Nigeria



### Location & Importance

Nigeria is a NEE in West Africa. Nigeria is just north of the Equator and experiences a range of environments. Nigeria is the most populous and economically powerful country in Africa. Economic growth has been base on oil exports.



### Influences upon Nigeria's development

#### Political

Suffered instability with a civil war between 1967-1970. From 1999, the country became stable with free and fair elections. Stability has encouraged global investment from China and USA.

#### Social

Nigeria is a multi-cultural, multi-faith society. Although mostly a strength, diversity has caused regional conflicts from groups such as the Boko Haram terrorists.

#### Cultural

Nigeria's diversity has created rich and varied artistic culture. The country has a rich music, literacy and film industry (i.e. Nollywood). A successful national football side.

#### Industrial Structures

Once mainly based on agriculture, 50% of its economy is now manufacturing and services. A thriving manufacturing industry is increasing foreign investment and employment opportunities.



### The role of TNCs

TNCs such as Shell have played an important role in its economy. + Investment has increased employment and income. - Profits move to HICs. - Many oil spills have damaged fragile environments.



### Changing Relationships

Nigeria plays a leading role with the African Union and UN. Growing links with China with huge investment in infrastructure. Main import includes petrol from the EU, cars from Brazil and phones from China.

### Environmental Impacts

The 2008/09 oil spills devastated swamps and its ecosystems. Industry has caused toxic chemicals to be discharged in open sewers - risking human health. 80% of forest have been cut down. This also increases CO<sup>2</sup> emissions.

### Aid & Debt relief

+ Receives \$5billion per year in aid. + Aid groups (ActionAid) have improved health centres, provided anti-mosquito nets and helped to protect people against AIDS/HIV. - Some aid fails to reach the people who need it due to corruption.

### Effects of Economic Development

Life expectancy has increased from 46 to 53 years. 64% have access to safe water. Typical schooling years has increased from 7 to 9.

## Case Study: Economic Change in the UK



### UK in the Wider World

The UK has one of the largest economies in the world. The UK has huge political, economic and cultural influences. The UK is highly regarded for its fairness and tolerance. The UK has global transport links i.e. Heathrow and the Eurostar.



### Causes of Economic Change

De-industrialisation and the decline of the UK's industrial base. Globalisation has meant many industries have moved overseas, where labour costs are lower. Government investing in supporting vital businesses.

### Towards Post-Industrial

The quaternary industry has increased, whilst secondary has decreased. Numbers in primary and tertiary industry has stayed the steady. Big increase in professional and technical jobs.

### Developments of Science Parks

Science Parks are groups of scientific and technical knowledge based businesses on a single site.
 

- Access to transport routes.
- Highly educated workers.
- Staff benefit from attractive working conditions.
- Attracts clusters of related high-tech businesses.

### CS: UK Car Industry



Every year the UK makes 1.5 million cars. These factories are owned by large TNCs. i.e. Nissan.
 

- 7% of energy used there factories is from wind energy.
- New cars are more energy efficient and lighter.
- Nissan produces electric and hybrid cars.

### Change to a Rural Landscape

#### Social

Rising house prices have caused tensions in villages. Villages are unpopulated during the day causing loss of identity. Resentment towards poor migrant communities.

#### Economic

Lack of affordable housing for local first time buyers. Sales of farmland has increased rural unemployment. Influx of poor migrants puts pressures on local services.



### Improvements to Transport



A £15 billion 'Road Improvement Strategy'. This will involve 10 new roads and 1,600 extra lanes. £50 billion HS2 railway to improve connections between key UK cities. £18 billion on Heathrow's controversial third runway. UK has many large ports for importing and exporting goods.

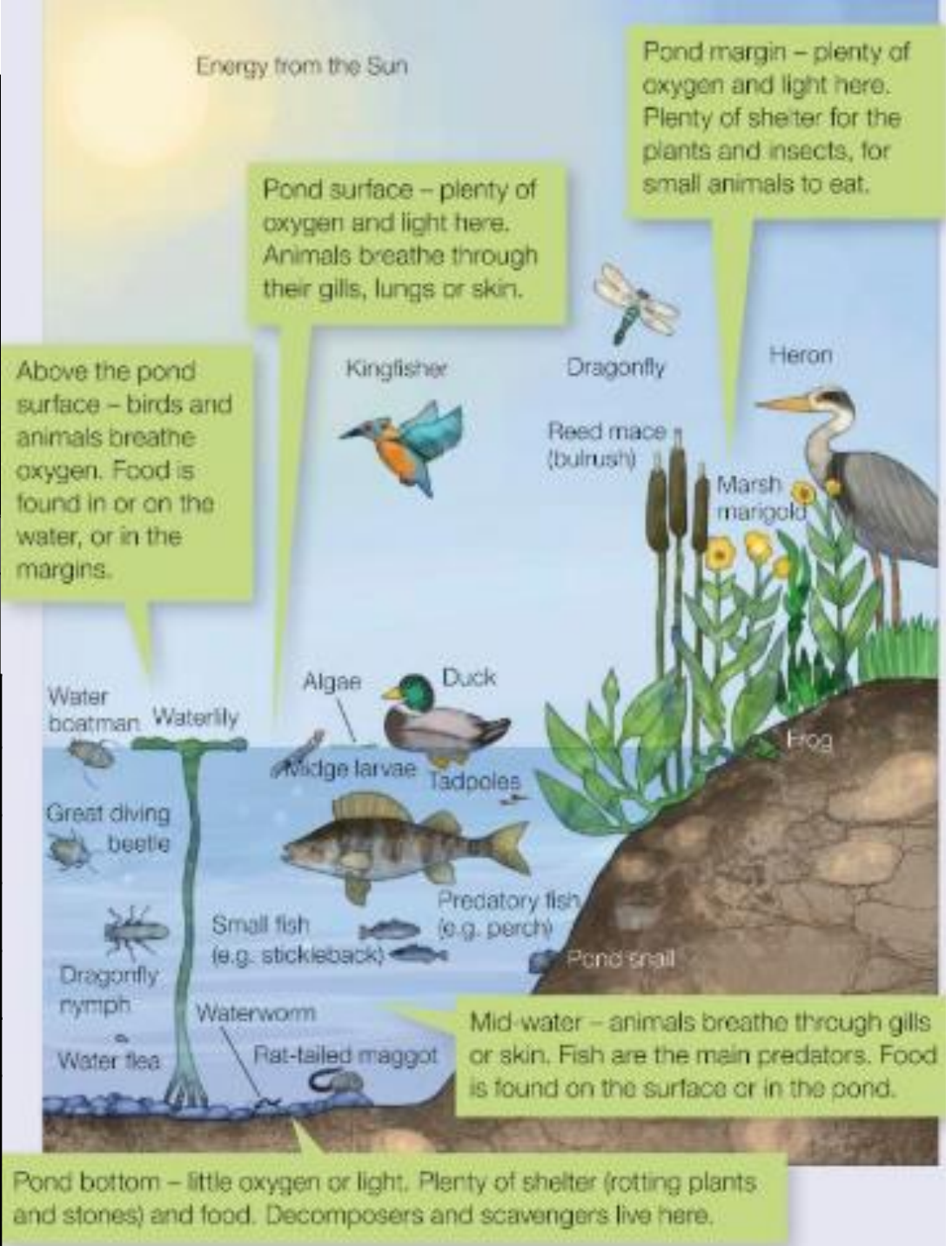
### UK North/South Divide

- Wages are lower in the North. - Health is better in the South. - Education is worse in the North. + The government is aiming to support a Northern Powerhouse project to resolve regional differences. + More devolving of powers to disadvantaged regions.

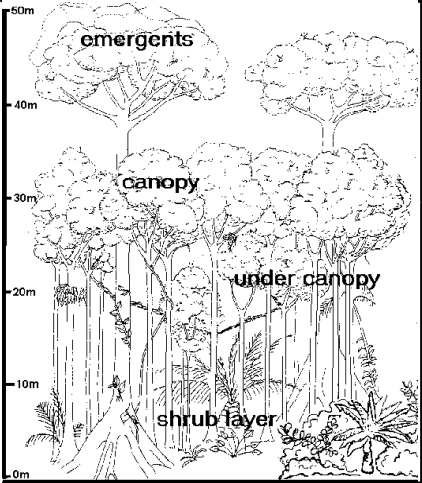
# Knowledge organiser: GCSE – The Living World - Ecosystems

Abiotic	Relating to non living things
Biotic	Relating to living things
Consumer	Creature that eats herbivores and / or plant matter
Decomposer	An organism that breaks down dead tissue which is then recycled to the environment
Ecosystem	A community of plants and animals that interact with each other and the physical environment
Food chain	The connections between different organisms that rely on one another as their food source
Food web	A complex hierarchy of plants and animals relying on each other for food
Nutrient cycling	A set of processes whereby organisms extract minerals necessary for growth from soil and water before passing them on through the food chain
Global ecosystem	Large biomes with flora and fauna adapting to their environment
Producer	An organism or plant that is able to absorb energy from the sun through photosynthesis

ECOSYSTEM	Key Characteristics	Biodiversity	The way of life in the world or a particular habitat
Tropical Rainforests	<ul style="list-style-type: none"> <li>Along equator (Asia, Africa / South America)</li> <li>6% earth's surface</li> <li>25°C – 30°C and over 250mm rain per year</li> </ul>	Convectional rainfall	Warm air at the surface heats up, rises, cools and condenses forming clouds. This leads to heavy daily rainfall
Temperate Grassland	<ul style="list-style-type: none"> <li>40° - 60° N of the equator (N America and E Europe)</li> <li>Centre of continents away from the sea</li> <li>Short grasses</li> <li>Wet and dry seasons</li> </ul>	<b>Factors affecting an ecosystem</b>	<b>How it affects it</b>
Coniferous Forest	<ul style="list-style-type: none"> <li>60°N (Scandinavia / Canada)</li> <li>Cone bearing evergreen</li> <li>No sunlight for part of the year</li> </ul>	Natural changes	Droughts can affect ponds and lakes.
Deciduous forests	<ul style="list-style-type: none"> <li>Higher latitudes (W Europe, N America, New Zealand)</li> <li>5 – 20°C and between 500 – 1500 mm rain per year</li> <li>4 distinct seasons</li> <li>Lose leaves in the winter to cope with the cold</li> </ul>	Human activity	Agricultural fertilisers – leads to eutrophication.  Woods cut down – destroys habitats and affects nutrient cycle
Tundra	<ul style="list-style-type: none"> <li>Above 60°N (Arctic Circle)</li> <li>Less than 10°C and less than 500mm per year rain</li> <li>Cold, icy and dry means 2 month growing season</li> </ul>		Conversion of ponds to farm land – kills fish and other pond life.
Mediterranean	<ul style="list-style-type: none"> <li>30- 40°N and S on west coast of continents</li> <li>Drought resistant small trees and evergreen shrubs</li> </ul>	<b>Example – Yellowstone National Park</b>	
Tropical Grasslands	<ul style="list-style-type: none"> <li>Between equator and tropics</li> <li>20 – 30°C and between 500- 1500 mm of rain per year</li> <li>Wet and dry seasons</li> </ul>	In 1995 wolves were introduced into the area. They killed the deer which meant that the trees grew back. This had many other knock on effects such as birds and beavers returning. The rivers banks were also stabilised due to the trees roots stabilising the banks.	
Deserts	<ul style="list-style-type: none"> <li>Tropics (Sahara and Australia)</li> <li>Over 30°C and less than 300 mm per year rain</li> <li>20% of land's surface</li> </ul>		



# Knowledge organiser: GCSE – The Living World – Tropical Rainforest



- Average temperature 27°C
- More than 2000 mm rain per year
- Wet season (December to May)
- Infertile soils
- Shallow roots
- 4 layers of vegetation
- Trees lose leaves all year

- PLANT ADAPTATIONS**
- Tall and straight to reach the sun
  - Buttress roots to support the tall trees
  - Lianas use trees to reach the sun
  - Drip tips so leaves don't rot
  - Thick waxy eaves
  - Smooth thin bark
  - Epiphytes grow on trees and get nutrients from air and water
  - Shade tolerant ferns

- ANIMAL ADAPTATIONS :**
- Sloths – hook to grip branches
  - Parrots – sharp beak for nuts and fruit; 4 toes per foot to clamber
  - Long limbed spider monkey – sharp nails to peel bark to get to sap
  - Flying frog – web like feet to glide through the air
  - Titan beetle – flies and lives on decaying material
  - Anteaters – long tongues; good smell and hearing; sharp claws to open ant hills
  - Harpy eagle – short pointy wings to manoeuvre

- INTERDEPENDENCE OF CLIMATE, WATER, SOILS, PLANTS, ANIMALS AND PEOPLE**
- Small changes to biotic and abiotic factors can have serious knock on effects
  - Biomass is the largest nutrient store and the biggest transfer is from soil to biomass
  - Fertility s quickly lost from the soil if trees are cut down
  - Poor soils due to leaching (the washing away of nutrients)
  - Thick litter layer. Rapidly breaks down due to climate
  - Warm humid climate means rapid plant growth


- ISSUES RELATED TO BIODIVERSITY**
- More than half the world's species are found in rainforests
  - Human exploitation is a major threat
  - Many extinct and endangered species are leading to a decrease in ecosystem productivity

**Goods and services**

**GOODS from rainforest :** Food; Building materials; HEP; Water; Medicines (1/4 of drugs use products found in the rainforest)

**SERVOCES from rainforest :** Air purification; Water and nutrient cycling; Protection from soil erosion; Habitats; Biodiversity; Employment.

**The Main Range, Peninsular Malaysia** – has over 600 species. 25% of all plant species found in Malaysia are here. There are many undiscovered medical plants.

Cause of deforestation	Definition and facts
Commercial farming	Farming on a large scale Malaysia is the largest exporter of palm oil in the world.
Deforestation	The chopping down and removal of trees to clear an area of forest 
Logging	The business of cutting down trees and transporting the logs to sawmills. Selective logging and clear felling. Teak and Mahogany worth the most. In the 1980's Malaysia became the world's largest exporter of highly valued tropical wood.
Subsistence farming	A type of agriculture producing food and materials for the benefit only of the farmer and his family. Slash and burn fires can grow out of control destroying large areas of forests.
Other uses	<ul style="list-style-type: none"> <li>• Road building – provide access to logging and mining areas</li> <li>• Settlement – Government resettled poor and gave them land</li> <li>• Energy development – HEP projects boost Malaysia's electricity supplies, e.g. The Baku Dam which opened in 2011.</li> <li>• Mineral extraction – tin mining and drilling for oil and gas.</li> </ul>


**Impact of deforestation in Malaysia**

- Economic development**
- Brings in jobs and income
  - Destroys resources in the long term
  - Livelihoods of locals destroyed
  - Rainforest tourism could decrease
  - Improved infrastructure for locals

- Soil erosion**
- Land left unprotected from heavy rain leads to landslides and flooding
  - Nutrients are washed away decreasing nutrients in the soil
  - Rivers silt up

- Contribution to climate change**
- Trees cut down change the water cycle and make it drier and warmer
  - Rainforests are the lungs of the earth and so when deforested there is ore carbon dioxide in the air and less oxygen. Burning also releases carbon to the air (Greenhouse effect)

- Others**
- Loss of biodiversity – undiscovered plant species and their medicinal properties
  - Loss of indigenous tribes (90 since 1990)
  - Tribal people moving to towns and cities and have drugs and alcohol issues. Loss of indigenous knowledge
  - Conflicts between developers and indigenous people
  - Water pollution

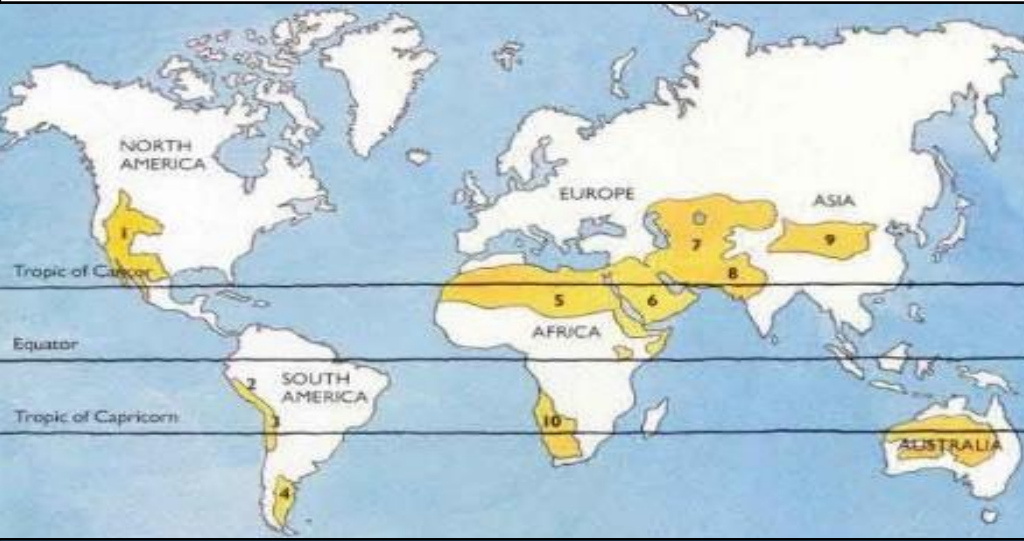
Sustainability	Actions and forms of progress that meets the needs of the present without reducing the ability of future generations to meet their own needs
STRATEGY	KEY FACTS
Selective logging and replanting	<ul style="list-style-type: none"> <li>• The cutting down of trees which are mature or inferior to encourage the growth of the remaining trees</li> <li>• Only fell fully grown trees on 30 – 40 year cycle</li> <li>• Replanting – collect seeds from primary forest; grow in nurseries and replant</li> <li>• Forest Stewardship Council – mark sustainably sourced timber</li> </ul>
Conservation and education	<ul style="list-style-type: none"> <li>• Education of locals key</li> <li>• WWF (NGO) – education; train conservation workers; provide practical help; buy threatened areas and set up nature reserves</li> </ul> 
Ecotourism	<ul style="list-style-type: none"> <li>• Responsible travel to natural areas that conserve the environment, sustains the well being of local people and may involve education</li> <li>• Minimises damage to environment and benefits locals</li> <li>• Small visitor numbers</li> <li>• Waste and litter disposed of properly</li> <li>• Locals employed so incentive to preserve environment</li> </ul>
International agreements about use of tropical hardwoods	<ul style="list-style-type: none"> <li>• International Tropical Trade Agreement 2006 and 2011 – restricts trade in hardwood from rainforests</li> <li>• Needs to be felled from sustainably managed areas and stamped with registration numbers</li> <li>• UN Sustainable development goals include protection of forests</li> <li>• The FSC promotes sustainably managed forestry through education programmes and its FSC labelled products.</li> </ul>
Debt reduction	<ul style="list-style-type: none"> <li>• Countries are relieved of some of their debt in return for protecting their rainforests</li> <li>• Debt for nature swaps – in 2010 USA converted debt of \$13.5 million from Brazil and used the funds to protect the rainforest</li> <li>• HICs wipe off debts of LICs</li> </ul>

The Achuar Tribe – 11, 000 people in the Peruvian Amazon, rely on the rainforest for food, fuel and buildings. There is oil in their region. The Achuar are resistant to oil exploration and in 2012 the oil company Talisman Energy stopped oil exploration in the region.



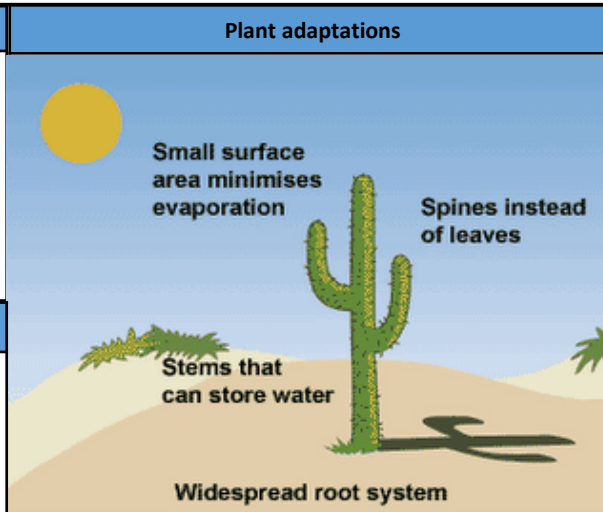
# Knowledge organiser: GCSE – Hot deserts

Characteristics
<ul style="list-style-type: none"> <li>Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm.</li> <li>Heat – hot deserts rise over 40 degrees.</li> <li>Landscapes – Some places have dunes, but most are rocky with thorny bushes.</li> <li>Soils – sandy or stony. Little organic matter. They can soak up water rapidly after rainfall. They are not fertile.</li> </ul>



Distribution
Most of the world's hot deserts are found in the subtropics between 20 degrees and 30 degrees north & south of the Equator. The Tropics of Cancer and Capricorn run through most of the worlds major deserts.

Climate of hot deserts
<ul style="list-style-type: none"> <li>Very little rainfall with less than 250 mm per year.</li> <li>It might only rain once every two to three years.</li> <li>Temperate are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C).</li> <li>In winter, deserts can sometimes receive occasional frost and snow.</li> </ul>



Animal adaptation
Many rodents, such as the jerboa are nocturnal and survive the heat by burrowing underground. Snakes and lizards retain water by having a waterproof skin and producing only small amounts of urine.

## Hot Desert: Case Study Thar Desert – India/Pakistan

The Thar Desert is located on the border between India and Pakistan in Southern Asia. With India soon becoming the most populated country in the world in the next five years. With this, more people will plan to live in the desert.

### Opportunities and challenges in the Hot desert

Opportunities	Challenges
<ul style="list-style-type: none"> <li>There are valuable minerals for industries and construction, such as gypsum and stone.</li> <li>Energy resources such as coal and oil can be found in the Thar desert.</li> <li>Great opportunities for renewable energy such as The Jaisalmer Wind Park.</li> <li>Thar desert has attracted tourists, especially during festivals.</li> </ul>	<ul style="list-style-type: none"> <li>The extreme heat makes it difficult to work outside for very long.</li> <li>High evaporation rates from irrigation canals and farmland.</li> </ul> <p>The <b>Indira Gandhi Canal</b> is the main form of irrigation in the desert. It was constructed in 1958 and has a total length of 650km.</p> <ul style="list-style-type: none"> <li>Water supplies are limited, creating problems for the increasing number of people moving into area.</li> <li>Access through the desert is tricky as roads are difficult to build and maintain.</li> </ul>

Hot Deserts inhabitants
<ul style="list-style-type: none"> <li>People often live in large <b>open tents</b> to <b>keep cool</b>.</li> <li>Food is often <b>cooked</b> slowly in the <b>warm sandy soil</b>.</li> <li><b>Head scarves</b> are worn by men to provide <b>protection from the Sun</b>.</li> </ul>



### Causes of Desertification

**Desertification means the turning of semi-arid areas (or drylands) into deserts. It is caused by both human and physical factors and it affects both poor and rich countries.**

<b>Fuel Wood</b> People rely on wood for fuel. This removal of trees causes the soil to be exposed.	<b>Overgrazing</b> Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.
<b>Over-Cultivation</b> If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.	<b>Population Growth</b> A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.
<b>Climate Change</b> Reduce rainfall and rising temperatures have meant less water for plants.	<b>Soil erosion</b> Where vegetation is destroyed, soil is exposed which cracks and breaks up. It can then be eroded by wind/rain.

**Example – Desertification in the Badia, Jordan**

The Badia is located in Jordan.

Physical causes of desertification

- less than 150mm of rainfall per year
- Temperatures exceed 40 degrees

Human causes of desertification

- 1991 Gulf War – sheep came in with people which led to overgrazing.

Desertification has made the land unproductive and people have moved away from the area.

## Strategies to reduce Desertification

- Water management** - growing crops that don't need much water.
- Tree Planting** - trees can act as windbreakers to protect the soil from wind and soil erosion.
- Soil Management** - leaving areas of land to rest and recover lost nutrients.
- Technology** – using less expensive, sustainable materials for people to maintain. i.e. sand fences, terraces to stabilise soil and solar cookers to reduce deforestation.
- Creation of National Parks** – The Desert National Park in the Thar desert – created in 1992 to protect 3000km2 of desert.

**Examples**

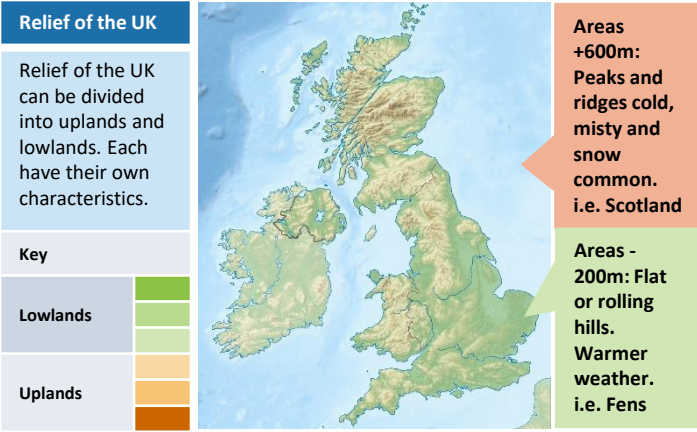
The Tal Rimah Rangeland Rehabilitation project – local people have build stone walls. Water is used to water the Atriplex shrubs. The shrubs hold the soil together and provide grazing for sheep and goats.

Jammi tree – used in the Thar desert. It provides foliage and seeds for animals to eat, fire wood, building materials, shade and the roots stabilise the sand dunes.



Magic Stones in Burkino Faso – Lines of stones have been used. Basic tools and trucks are used to transport the stones and locals build walls between 0.5-1.5m high along the contours. This stops any rainwater from washing down the slope.





### Types of Erosion

The break down and transport of rocks – smooth, round and sorted.

<b>Attrition</b>	Rocks that bash together to become smooth/smaller.
<b>Solution</b>	A chemical reaction that dissolves rocks.
<b>Abrasion</b>	Rocks hurled at the base of a cliff to break pieces apart.
<b>Hydraulic Action</b>	Water enters cracks in the cliff, air compresses, causing the crack to expand.

### Types of Transportation

A natural process by which eroded material is carried/transported.

<b>Solution</b>	Minerals dissolve in water and are carried along.
<b>Suspension</b>	Sediment is carried along in the flow of the water.
<b>Saltation</b>	Pebbles that bounce along the sea/river bed.
<b>Traction</b>	Boulders that roll along a river/sea bed by the force of the flowing water.

### 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.

### Types of Weathering

Weathering is the breakdown of rocks where they are.

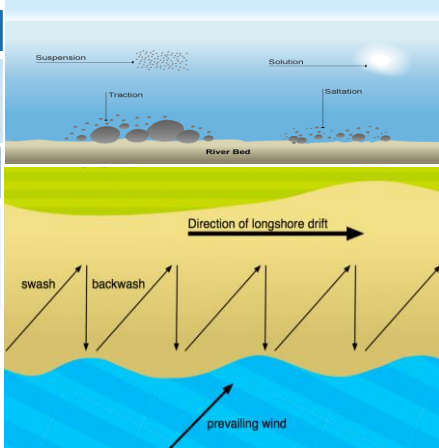
<b>Chemical</b>	Breakdown of rock by changing its chemical composition, e.g. acidic rainwater
<b>Mechanical</b>	Breakdown of rock without changing its chemical composition, e.g. freeze-thaw weathering
<b>Biological weathering</b>	This occurs due to the actions of plants and animals. E.g plant roots break rocks, animals burrow into weak rocks.

### What is Deposition?

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

### What is longshore drift?

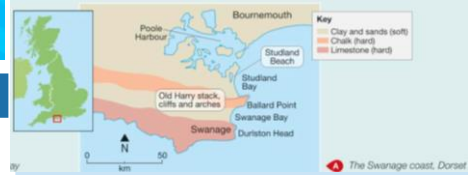
The movement of material along the beach. When the waves approach at an angle, sediment will be moved along in a zig-zag pattern.



## Physical Landscapes in the UK

### Coastal landforms at Swanage

**Where?** Dorset, south coast of England. It has many erosional and depositional landforms. It is also known as the Jurassic Coast.

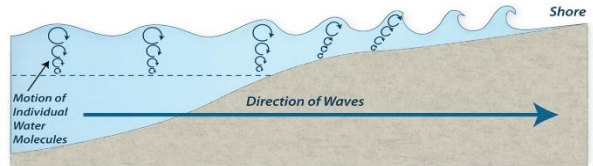


### How do waves form?

Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

### Why do waves break?

1	Waves start out at sea.
2	As waves approaches the shore, friction slows the base.
3	This causes the orbit to become elliptical.
4	Until the top of the wave breaks over.



### Mechanical Weathering Example: Freeze-thaw weathering

<b>Stage One</b>	Water seeps into cracks and fractures in the rock.		<b>Stage Two</b>	When the water freezes, it expands about 9%. This wedges apart the rock.		<b>Stage Three</b>	With repeated freeze-thaw cycles, the rock breaks off.	
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Size of waves	Types of Waves	
<ul style="list-style-type: none"> <li>Fetch how far the wave has travelled</li> <li>Strength of the wind.</li> <li>How long the wind has been blowing for.</li> </ul>	Constructive Waves	Destructive Waves
	<p>This wave has a <b>swash that is stronger</b> than the backwash. This therefore builds up the coast. They form gentle beaches</p>	<p>This wave has a <b>backwash that is stronger</b> than the swash. This therefore erodes the coast. They form more steep beaches</p>

**Landforms -** This indented coastline is called a discordant coastline. The south coast has one rock type – limestone – this forms a concordant coastline. To the south of Swanage is Poole Harbour. A lot of deposition has taken place in this bay. There are two spits at the mouth of the harbour. At Studland there are lagoons, saltmarshes and sand dunes.

## Coastal Defences - Hard Engineering Defences

<b>Groynes</b>	Wood barriers prevent longshore drift, so the beach can build up.	£150,000 each, at 200m intervals	<ul style="list-style-type: none"> <li>✓ Beach still accessible.</li> <li>✗ No deposition further down coast = erodes faster.</li> </ul>
<b>Sea Walls</b>	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	£5000-100000 per metre	<ul style="list-style-type: none"> <li>✓ Long life span</li> <li>✓ Protects from flooding</li> <li>✗ Curved shape encourages erosion of beach deposits.</li> </ul>
<b>Gabions or Rip Rap</b>	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	Up to £50,000 per 100m.	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Local material can be used to look less strange.</li> <li>✗ Will need replacing.</li> </ul>

## Coastal Defences - Soft Engineering Defences

<b>Beach Nourishment</b>	Beaches built up with sand, so waves have to travel further before eroding cliffs.	up to £5000,000 per 100m	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Beach for tourists.</li> <li>✗ Storms = need replacing.</li> <li>✗ Offshore dredging damages seabed.</li> </ul>
<b>Dune regeneration</b>	Grasses planted to stabilise dunes and help them develop. Fences used to keep people off sand dunes.	£200-1000 per 100m	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Maintains a natural coastline, popular with people and wildlife.</li> <li>✗ Time consuming to plant grasses and fence areas off.</li> <li>✗ Can be damaged by storms.</li> </ul>
<b>Managed Retreat</b>	Low value areas of the coast are left to flood & erode. <b>Medmerry Managed retreat, West Sussex</b> – the flat, low lying coast is mainly used for farming and caravan parks. It was protected by a sea wall, but this now need repairing. Due to the low value of the land, it was decided to allow the sea to breach the wall.		<ul style="list-style-type: none"> <li>✓ Reduce flood risk</li> <li>✓ Creates wildlife habitats.</li> <li>✓ Most sustainable option</li> <li>✗ Compensation for land.</li> </ul>

## Case Study: Lyme Regis

**Location and Background**  
Located on the south coast of England, on the Jurassic coast. It is a popular tourist destination.

**What are the issues?**  
Much of the town has been built on unstable cliffs. The coastline is eroding rapidly. Many properties have been destroyed. The sea wall has been breached many times.

**Management**  
**Phase 1** – 1990-1995 – New sea wall and promenade, 2003-2004 a £1.4 million emergency project was completed to stabilise the cliffs. Hundred of large nails were used to hold the rocks together.  
**Phase 2** – 2005-2007 – improvements to the sea front, costing £22 million. New sea walls, creation of wide sand and shingle (from the English channel) beach to absorb wave energy, extension of rock armour at The Cobb.  
**Phase 3** – The plan was to help prevent landslips and erosion to the west of The Cobb. It was decided to leave this area alone as the costs outweighed the benefits.  
**Phase 4** – 2013-2015 – final phase focused on the coast east of the town. Cost £20 million. Construction of a 390m sea wall in front of the existing wall, nailing, piling and drainage to provide cliff stabilisation to protect 480 homes.

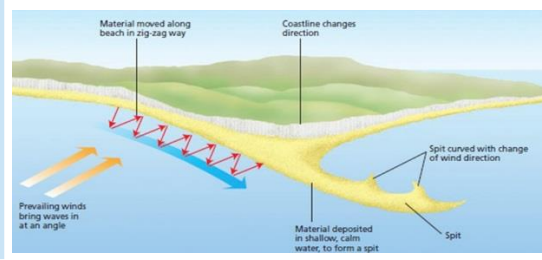
**How successful?**  
**Positives** – increased visitors due to beaches, defences have stood up to stormy winters, boat owners and fishermen benefit from harbour being better protected.  
**Negatives** – increased visitors lead to conflict with locals, natural landscape spoilt, sea defences interfere with other stretches of coastline.

## Formation of Coastal Spits and Bars- Deposition

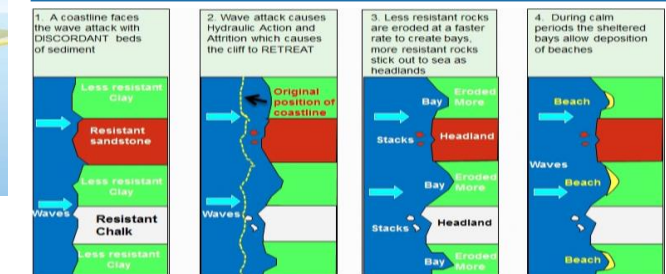
### Example: Spurn Head, Holderness Coast.

- Swash moves up the beach at the angle of the prevailing wind.
- Backwash moves down the beach at 90° to coastline, due to gravity.
- Zigzag movement (Longshore Drift) transports material along beach.
- Deposition causes beach to extend, until reaching a river estuary.
- Change in prevailing wind direction forms a hook.
- Sheltered area behind spit encourages deposition, salt marsh forms.
- A bar forms when a spit grows right across a bay.

## Physical Landscapes in the UK

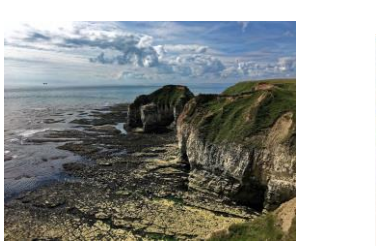
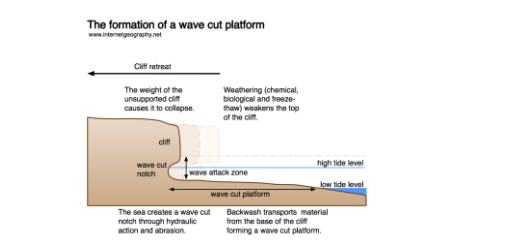


## Formation of Bays and Headlands

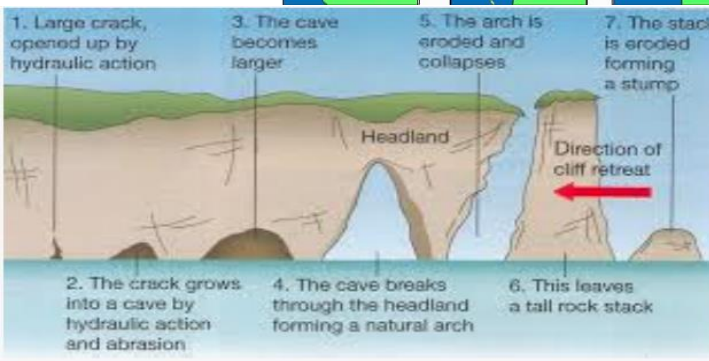


- Waves attack the coastline.
- Softer rock is eroded by the sea quicker forming a bay, calm area causes deposition.
- More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

## Formation of cliffs and wave-cut platforms.



- When a wave breaks against a cliff, erosion will wear away at the bottom on a cliff, forming a wave-cut notch.
- Over a long period of time, the notch will get deeper and deeper, undercutting the cliff.
- Eventually, the cliff above collapses.
- Over time the cliff will retreat
- In its place will be a gentle sloping rocky platform called a wave-cut platform.

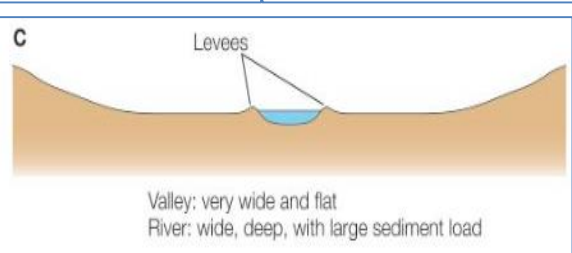
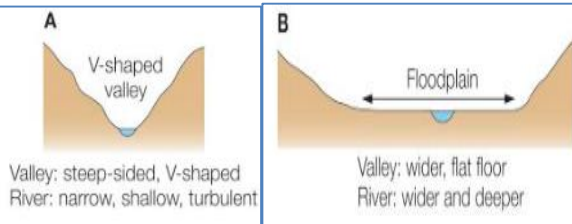


## Formation of Coastal Stack

### Example: Old Harry Rocks, Dorset

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

Drainage basin Key Terms	
Drainage basin	An area of land drained by a river and its tributaries.
Source	The start of the river
Tributary	A small stream that joins a larger river
Confluence	Where a tributary joins a larger river
Mouth	Where the river meets the sea
Watershed	The edge of a river basin.



Water Cycle Key Terms	
Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevent water reaching the ground.
Surface Runoff	Water flowing over surface of the land into rivers
Infiltration	Water absorbed into the soil from the ground.
Transpiration	Water lost through leaves of plants.

**Case Study: The River Tees**

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

**Geomorphic Processes and landforms**  
**Upper** – Features include V-Shaped valley, rapids and waterfalls. High Force 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.


Physical and Human Causes of Flooding.	
<b>Physical: Prolong &amp; heavy rainfall</b> Long periods of rain causes soil to become saturated leading runoff.	<b>Physical: Geology</b> Impermeable rocks causes surface runoff to increase river discharge.
<b>Physical: Relief</b> Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.	<b>Human: Land Use</b> Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

**Upper Course of a River**

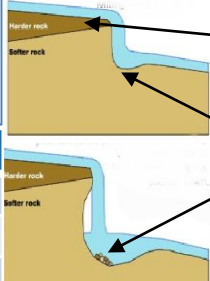
Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

**Features of the upper course - Interlocking spurs**

The river cuts down into the valley. If there are areas of hard rock which are harder to erode, the river will bend around it. This creates **interlocking spurs** of land which link together like the teeth of a zip.



**Features of the upper course - Formation of a Waterfall**

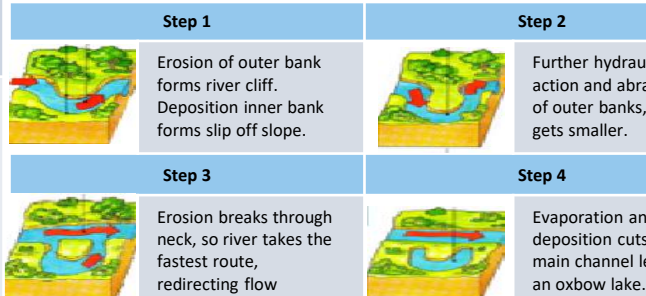


- 1) River flows over alternative types of rocks.
- 2) River erodes soft rock faster creating a step.
- 3) Further hydraulic action and abrasion form a plunge pool beneath.
- 4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
- 5) Waterfall retreats leaving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

**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**



**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.

**Step 3**  
Erosion breaks through neck, so river takes the fastest route, redirecting flow

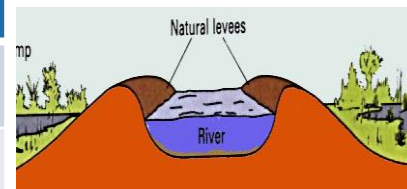
**Step 4**  
Evaporation and deposition cuts off main channel leaving an oxbow lake.

**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 build up to form natural levees.



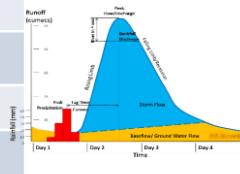
- ✓ Nutrient rich soil makes it ideal for farming.
- ✓ Flat land for building houses.

**River Management Schemes**

Soft Engineering	Hard Engineering
<p><b>Afforestation</b> – plant trees to soak up rainwater, reduces flood risk.</p> <p><b>Demountable Flood Barriers</b> put in place when warning raised.</p> <p><b>Managed Flooding</b> – naturally let areas flood, protect settlements.</p>	<p><b>Straightening Channel</b> – increases velocity to remove flood water.</p> <p><b>Artificial Levees</b> – heightens river so flood water is contained.</p> <p><b>Deepening or widening river</b> to increase capacity for a flood.</p>

**Hydrographs and River Discharge**

River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

1. **Peak discharge** is the discharge in a period of time.
  2. **Lag time** is the delay between peak rainfall and peak discharge.
  3. **Rising limb** is the increase in river discharge.
  4. **Falling limb** is the decrease in river discharge to normal level.
- 

**Managing floods at Banbury.**

**Location and Background**  
Located in the Cotswold Hills, 50km north of Oxford. Much of the town is on a floodplain of the River Cherwell.

**How has Banbury been affected by flooding?**  
 1988 – the towns railway station and local roads were closed. Led to £12.5 million damage. 150 homes and business affected.  
 2007 – floods affected many more homes and businesses.

**What has been done to reduce the risk of flooding?**  
 In 2012 the flood defence scheme was completed.
 

- A 2.9km embankment built next to M40 to create a flood storage area.
- A361 was raised – improvements to drainage.
- New pumping station
- Creation of a new Biodiversity Action Plan – with ponds, trees and hedgerows to absorb and store water.

**Costs and benefits**

- The raised A361 can now be open during times of flooding.
- Quality of life for people improved – reduced stress and anxiety for people
- 100 million tonnes of earth required to build the embankment. This created a small reservoir.
- 441 houses and 73 commercial properties protected. Benefits at over £100 million.
- Cost £18.5 million
- Part of the floodplain will be deliberately flooded if river levels are too high.