

PAPER 2: HUMAN GEOGRAPHY

Section A: Urban Issues and Challenges (17-21)

- *Case study of a major city in the UK: London*
- *An example of an urban regeneration project: Lower Lea Valley*
- *Case study of a major city in a LIC or NEE: Rio de Janeiro*
- *An example of how urban planning improves the quality of life for the urban poor: Favela Bairro Project*

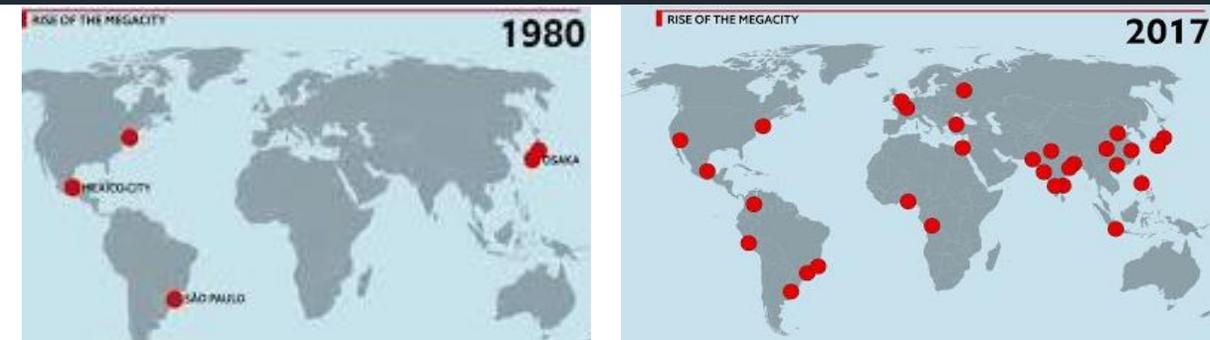
Section B: The Changing Economic World (22-26)

- *An example of how tourism can reduce the development gap: Jamaica*
- *A case study of an LIC or NEE: Nigeria*
- *A case study of an HIC: the UK*
- *An example of how modern industries can be environmentally sustainable: Nissan*

Section C: The Challenge of Resource Management (27-29)

- *Example of a large scale agricultural development: Thanet Earth*
- *Example of a local scheme in an LIC or NEE to increase food sustainably: Makueni food and water security programme*

Urbanisation is.....	The increase in people living in towns and cities
More specifically.....	In 1950 33% of the world's population lived in urban areas, whereas in 2015 55% of the world's population lived in urban areas.
By 2050.....	It is predicted 70% will be living in urban areas.
Urban growth	The increase in land covered by cities
Urban growth is caused by.....	Natural increase and rural to urban migration.
Urbanisation results in the creation of....	Megacities
A megacity is...	An urban area with over 10 million people living in it. For example Mumbai, Tokyo and Mexico City.
Natural increase is.....	If a country has a higher birth rate than death rate, the population will naturally increase. This type of population is often found in stages 2 and 3 of the DTM where there is a high number of young adults (18-35 years) who are having lots of children and few older people who are dying due to improved healthcare. Therefore urban growth is common in NEEs.
Rural to urban migration is...	The movement of people from the countryside to cities. It is caused by push factors (pushing people out of rural areas) and pull factors (pulling people to cities).
Push factors are....	Factors that push people out of an area. Negative factors that make people want to leave an area.
Pull factors are....	Factors that pull people out of an area. Negative factors that make people want to leave an area.
Rural to urban migration push factors make people want to leave rural areas. Examples include.....	<ul style="list-style-type: none"> Farming is hard and poorly paid Increased use of machinery in farming = less people needed to work = unemployment Dry land in rural areas caused by desertification = land cannot be farmed Fewer doctors, hospitals, schools and transportation routes
Rural to urban migration pull factors make people want to move to urban areas. Examples include.....	<ul style="list-style-type: none"> More highly skilled, better paid jobs Range of entertainment opportunities More and better doctors and hospitals More schools and better education Better transportation routes/public transport



Three are currently 34 megacities in the world.

Most megacities are located... More specifically.....	In LICs and NEEs 65% of all megacities are located in LICs and NEEs.
Urban growth is happening more in LICs/NEEs due to... More specifically.....	Industrialisation As a country develops their economy changes from agriculture (primary) to manufacturing (secondary) and services (tertiary). This occurs during the industrial revolution. Most of the secondary and tertiary jobs are in towns and cities. When this occurs, lots of people move from rural to urban areas = rapid urbanisation. <ul style="list-style-type: none"> The UK and other HICs had their industrial revolution in the 18th & 19th centuries. LICs and NEEs are going through their industrial revolution now. For example China's industrial revolution started in 1980. As a result more people in LICs and NEEs are currently moving to urban areas.
Urban growth is happening more in LICs/NEEs due to... More specifically.....	Natural increase LICs and NEEs are in stages 2 and 3 of the demographic transition model. In these stages there is a high birth rate and lower death rate = more people are born than are die = the population naturally increases. In HICs there is a low death rate and even lower birth rate = the population is declining.
Urban growth is happening more slowly in HICs due to... More specifically.....	Counter-urbanisation. In HICs, people are deciding to leave cities and live in the surrounding countryside to get a better quality of life (less pollution, quieter, more space). They can commute to work due to improved transportation.
Case study of an urban area in an LIC or NEE:	Rio de Janeiro
Case study of an urban area in the UK	London

EXAMPLE OF AN URBAN AREA IN AN LIC OR NEE: RIO DE JANEIRO is located in Guanabara Bay, on the south-east coast of Brazil. It lies next to the Atlantic Ocean. It is the cultural capital of Brazil and 2nd largest city, with a population of 12.5 million.

Rio is important at a range of levels:

- At the **REGIONAL** level it provides schools, hospitals, universities, employment, leisure and recreation. It is important due to its art and culture scene. It also is an important transport hub with airports and docks.
- At the **NATIONAL** (country) level it is home to many of Brazil's largest company headquarters, including mining, oil and telecommunications. Rio is a major centre specialising in clothing, processed food, chemicals and pharmaceuticals.
- At the **INTERNATIONAL** level, it hosts international events such as the 2014 World Cup and 2016 Olympics, as well as many of its companies trading internationally.



These factors have attracted a multicultural population, with people from all over the world moving to Rio to live: *South Korea, China, UK, USA, Portugal, Argentina and Bolivia.*

Urban growth in Rio de Janeiro has created many social and economic opportunities:

Opportunity	Evidence in Rio
JOBS	<ul style="list-style-type: none"> Rio provides >6% of all jobs in Brazil. Rio is home to many manufacturing industries, (pharmaceuticals, clothing, furniture and processed foods) and service industries (banking, insurance). As Rio grows there are many jobs in construction
BUSINESS OPPORTUNITIES	<ul style="list-style-type: none"> The growth of urban industrial areas can increase economic development. It will attract businesses to the area. Rio produces 5% of Brazil's GDP.
EDUCATION	<ul style="list-style-type: none"> Rio provide grants to poor families to encourage children to attend school. Rio have many volunteers who help in schools. There are adult classes to help adults gain skills = better jobs
SERVICES	<ul style="list-style-type: none"> Rio has a new nuclear generator and hydro-electric power station = more energy produced. 60km of new electricity lines = better access to energy By 2014, 95% of Rio had access to a mains water supply. This was due to 7 new water treatment plants and 300km of new water pipes being laid. 12 new sewage works have been built and 5km of sewage pipes installed in badly polluted areas.
HEALTHCARE	<ul style="list-style-type: none"> Some areas in Brazil (Barra de Tijuna) have a life expectancy of 80 years old. Brazil (as a country) has an average life expectancy of 63 years. Medical staff go into favelas and offer emergency medication to people's homes.
ENTERTAINMENT	<ul style="list-style-type: none"> One of the world's top tourist destinations - The Statue of Christ the Redeemer, stunning natural surroundings and entertainment.
TRANSPORT	<ul style="list-style-type: none"> It has two major airports and five shipping ports Public transport, toll roads and one way systems to control traffic

Urban growth in Rio has also created many social, economic & environmental challenges	
Challenge	Evidence in Rio
Lack of healthcare	In 2013 only 55% of the city had a local family health clinic.
Lack of education	Only 50% of children continue education past 14 years old. Lack of schools, teachers and funding.
Lack of water supply	37% of water is lost due to leaky pipes and illegal access = people do not have access.
Lack of energy	Due to rapid population growth and illegal tapping onto electricity lines there are frequent blackouts.
Unemployment	Many people are unemployed in Rio,
Air pollution	Cars & growth of factories = 5000 deaths per year. Very little flat land in Rio means all roads are concentrated in small areas of flat land = congestion. In the past 10 years the number of cars has increased by 40%.
Solution:	Expanding metro (public transport) and creating toll roads that you pay to use = less cars on roads.
Water pollution	200 tonnes of raw sewage & 50 tonnes of industrial waste pour into Guanabara Bay each day. Also oil from oil spills (e.g. Petrobras oil refinery) and fuel from ships goes into the water.
Solution:	12 new sewage works and 5km of sewage pipes installed and ships are fined for discharging fuel in bay.
Waste pollution	A lack of waste disposal = rubbish on streets.
Solution:	New biogas power plant makes energy from rubbish. It consumes 30 tonnes of rubbish each day.
Creation of squatter settlements (favelas)	<p>These are illegal settlements on the outskirts of cities. Characteristics:</p> <ul style="list-style-type: none"> Poorly built homes using basic materials Houses built on steep slopes = landslides (e.g. 2010: 224 killed and 13,000 lost their homes) 30% no electricity, 50% no sewage system and 12% no running water. 20% are unemployed. Those who are, are often employed in informal sector (e.g. street vendor), which are poorly paid (<£60/month), no contract, no taxes paid. Drug gangs are common & police is rare (murder rate is 20 per 1000people) High population densities (37,000 per km²) + a lack of waste disposal = spread of diseases. This is made worse by a lack of healthcare. As a result there are high death rates and a very high infant mortality rate of 50 per 1000 people.

URBAN PLANNING: improving quality of life in favelas. The Favela Bairro Project is an example of an URBAN PLANNING scheme that improves the quality of life for the urban poor. It works on developing Complexo do Alemão, a favela in northern Rio de Janeiro.

- Roads have been improved and paved
- Improved access to water pipes and sanitation
- Hillsides strengthened to prevent landslides
- New healthcare, leisure and education facilities
- New cable car was built, connecting the favela to Bonsucesso Station, where trains go to city centre, however it closed in 2016 due to a lack of government funding.
- 100% mortgages provided for locals to buy homes
- A Pacifying Police Unit (UPP) was set up = less crime

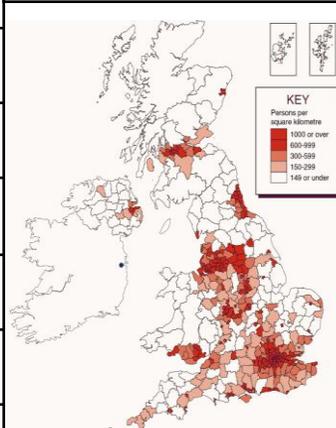


Successful because: access/mobility is better = access to jobs in city centre, improved healthcare, education, access to services, 100% mortgages = more people can buy homes, less crime, fewer landslides.

Unsuccessful because: new infrastructure not maintained and residents did not have skills to fix it, area improved = increase in demand to live there = increase in rent = poorest had to move, budget of US\$1 billion could not help all favelas.

Population Distribution	The way something is spread out over an area.
Industrialisation	Growth of secondary manufacturing
De-industrialisation	Decline of secondary manufacturing
Post industrial economy	Economy is mainly tertiary and quaternary industries
Brownfield site	Land that has previously been built on
Greenfield site	Land that has never previously been built on
International Migration	The movement of people across countries.

Choropleth map showing the UK's population distribution:



There is a dense population....	In the south east. More specifically 32% live in the south east.
There is a sparse population.....	In the north of England, Scotland and Wales.
This is because....	It is warmer, <i>less rainfall, flatter land in the SE. In central Scotland and Wales its is colder, more rainfall and mountainous.</i>
How many people live in urban areas?	82%
People live in urban areas because of job opportunities. More specifically.....	Most secondary, tertiary and quaternary jobs are located in urban areas. ➤ Industrialisation in 18 th and 19 th centuries = factories opened in urban areas = urbanisation. ➤ 1950s: de-industrialisation = growth of tertiary and quaternary jobs which are located in urban areas.
This is because.....	
People live in urban areas due to social opportunities. More specifically.....	➤ More entertainment options (restaurants, theatre, cinemas, shopping), better healthcare, education, housing...etc.

CASE STUDY OF AN URBAN AREA IN THE UK: LONDON

Urban Growth	The increase in land covered by urban areas.
Urban Sprawl	Unplanned growth of urban areas into the surrounding rural area
Urban Greening	Increasing the amount of green space in a city.

Population in 2015	8.6 million
Predicted population in 2030	10 million
Demographic of population	Young people in their 20s & 30s. Many immigrants travel to London to work and live creating a multicultural population.
Positive impacts of immigration	<i>Culture (food (Brixton village), music (BBC Asian radio), festivals (Brixton Splash, Notting Hill carnival), religious sites, large workforce</i>
Negative impacts of immigration	<i>Language barrier, segregation of groups of people (e.g. Brixton = Caribbean, Elephant & Castle = Latino), lack of housing, schools, healthcare and services.</i>

EXAMPLE OF URBAN REGENERATION: LOWER LEA VALLEY – OLYMPIC PARK

Social Inequalities	Some areas have more opportunities than others.
Rural-urban Fringe	The area on the edge of a city, where it meets the countryside.
Green Belt	Protected land at the rural-urban fringe where building is restricted.
Dereliction	Areas that are abandoned and become run down
Urban Regeneration	The reversal of urban decline through redevelopment, aiming to improve the local economy

Location	<i>East London, along the River Lea (a tributary of the River Thames)</i>
Why did the area go into decline?	It grew as an industrial area in the 18 th and 19 th century. The closing of the ports, increase in manufacturing abroad and growth of tertiary and quaternary industries = many factories closed and people moved away. The area became rundown, abandoned and derelict.
What happened in 2007	In 2007 London won the bid for the 2012 Olympics and choose the Lower Lea Valley as the site for the Olympic Park. Therefore the area became an example of an urban regeneration project.
BENEFITS OF THE DEVELOPMENT	<ul style="list-style-type: none"> • New homes (2800 new homes with 8000 more planned by 2030 in East Village) • A new school in the East Village for 1800 students • New shopping centre (Westfield Stratford) and new sport venues (velopark (cycling), aquatics centre (swimming), Olympic stadium. • New transport links • New businesses and jobs: East Village (35 businesses - shops, cafes, bars, gym), Here East (creative and media businesses with 5000 jobs), International Quarter (offices employing 25,000 people) and Westfield (10,000 jobs) • New parks: Queen Elizabeth Park (>100 hectares of open space) and 10 hectares of parks and open space in the East Village.

Social Deprivation	When a person or area is deprived of services and amenities.
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NEGATIVES OF THE DEVELOPMENT	<ul style="list-style-type: none"> • It cost £9.3 billion. Could the money have been spent to help more people rather than make one area perfect for the Olympics? • People were relocated from their homes. • The area improved so much that it became too expensive for the existing residents to continue living there.
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LONDON is located in the south-east of England. It was created during the Roman era due to the River Thames providing ports for trade. It grew during the industrial revolution (18th and 19th centuries) as factories opened up in the city = more people moved to London for jobs.

- **National importance:** *London is the UK’s capital, the UK’s largest city and the UK’s wealthiest city. It is home to many jobs, tourism, world class universities (Kings College London, UCL, LSE), iconic buildings and architecture.*
- **International importance:** *it is one of the two most important financial centres in the world (with New York), many large international companies have their headquarters in London and tourism.*

URBAN GROWTH AND CHANGE IN LONDON HAS CREATED A NUMBER OF OPPORTUNITIES

SOCIAL OPPORTUNITIES

- **Culture:** museums (*The Natural History Museum, The National Gallery*), Buckingham Palace, Houses of Parliament
- **Entertainment:** theatres (*The National at South Bank, West End*), cinemas (*vue/odeon Leicester Square*)
- **Music:** O2 Arena, Hammersmith Apollo
- **Sport:** football (*Wembley*), tennis (*Wimbledon*), rugby (*Twickenham*)
- **Restaurants:** lots of cuisines.
- **Festivals:** Notting Hill Carnival, Brixton Splash
- **Integrated transport system:** different forms of public transport are linked to make it easier for people to get around London more quickly. (Waterloo station connects trains, tube, buses and cycle routes)

ECONOMIC OPPORTUNITIES

JOBS:

- in 2012, there were 5 million jobs in London.
- In 2010, London’s share of the UK’s GDP was £274 billion.
- Average wage: £34,473/year (£12,000 more than the UK average)
- **Tertiary:** *finance, real estate, law, accountancy, advertising, market research, management consultancy.* London is responsible for 46% of the UK’s total GDP from the financial and insurance industries.
- **Quaternary:** Old street has been nicknamed ‘*Silicon Roundabout*’.

ENVIRONMENTAL OPPORTUNITIES

LONDON HAS AN INTEGRATED TRANSPORT SYSTEM. This makes it easier to use public transport = less cars = less pollution.

- London has created an integrated transport system that links different forms of public transport = makes it easier to use (Waterloo station connects trains, tube, buses and cycle routes).
- Creation of the cycle superhighways – new cycle lanes (not on roads = safer)

URBAN GREENING: LONDON HAS INCREASED AND PRESERVED OPEN GREEN SPACES.

- 47% of London is green space.
- There are 700 roof gardens in London
- Central London parks: *Regents Park, Hyde Park, Green Park*
- Local parks: *Brockwell Park, Archbishops Park*

Benefits of green spaces: *trees produce oxygen, reduce the risk of flooding, provide habitats for wildlife and provide spaces for recreational use (healthy).*

Strategies to protect our green space: connecting green areas to make them more accessible, creating new green spaces (e.g. Garden Bridge)

URBAN GROWTH AND CHANGE IN LONDON HAS CREATED A NUMBER OF CHALLENGES

DERELICT AREAS



During the industrial revolution (industrialisation), many factories opened in urban areas = people moved to urban areas for new jobs = urban growth. However, in the 1950s de-industrialisation occurred because:

- The boats got too big for the docks. The boats were needed to bring primary goods to manufacture into secondary goods in factories (e.g. tobacco into cigarettes, cotton into clothes). As a result, docks closed down.
- Factories moved abroad due to cheap labour and less strict environmental laws.

As a result many factories closed down and people moved away from the area. As a result, many inner city areas, such as the London Docklands, became abandoned, run-down and deprived.

SOCIAL INEQUALITY

Some areas in London are more deprived than others. This is known as **social inequality**. It is due to a lack of investment from the government. It can have a number of knock on effects, affecting exam results, employment, income, health...etc.

Measure of deprivation	Kensington & Chelsea	Newham
Male life expectancy	83.7	75.7
Female life expectancy	87.8	79.8
Unemployment	3.9%	9.4%
Pupils achieving five + good GCSE grades	80%	62%
Households with joint income < £15,000	9%	26%
Households with joint income > £60,000	26%	7%

URBAN SPRAWL

Many people want to live in urban areas due to better jobs, higher incomes, more entertainment options, better education...etc. Unfortunately, there are not enough houses for the demand. London’s population is growing by 100,000 people per year, however only 20,000 new homes are being built

There are two options of where to build new homes:

1. Building on **brownfield sites**: redeveloping derelict land in city centres.
 - *Reduces urban sprawl and habitat loss, more public transport = less cars = less pollution*
 - *More expensive*
2. Building on **greenfield sites**: building new homes on land that has never been built on before. Usually on the outskirts of urban areas (**rural-urban fringe**). This results in urban sprawl. Urban sprawl is the unplanned growth of urban areas into the surrounding rural areas.
 - *Cheaper, more space, cleaner air, larger houses*
 - *Green land and habitats are lost and more cars are used due to less public transport = pollution*

To protect greenfield sites on the edges of urban areas, London has created a **green belt**, on which there are very strict planning controls to prevent further urban sprawl.

POLLUTION

Air pollution

London suffers from significant air pollution. The main cause is cars and heating systems in homes. Long term exposure to air pollution causes 4000 premature deaths a year in London.

- *Solution: improvements to public transport (creation of cycle superhighway, integrated transport system, Boris bikes, oyster card).*

Waste pollution

¼ of London’s waste goes to landfills = environmental problems (production of methane and water and ground pollution).

- *Solution: increase or recycling and using waste to produce energy (biogas)*

SUSTAINABLE URBAN PLANNING

Sustainable cities are cities that meet the needs of the people who live in them today, without meaning that future generations do not have their needs met. Basically it means behaving in a way that does not irreversibly damage the environment or use up resources faster than they can be replaced. There are many things that cities can do to be more sustainable.

Sustainable cities focus on:

1. Preventing the overuse of water
2. Preventing the overuse of electricity and generating energy from renewable energies.
3. Urban greening – creating and protecting green spaces within the city. Green spaces provide clean air, habitats and prevent flooding during intense rainfall. They also create a relaxing space for people and encourage exercise.

In 1970 Freiburg set itself the goal to become a sustainable city. It is located in south-west Germany.

TRAFFIC MANAGEMENT STRATEGIES

Traffic congestion can lead to a number of problems: *air pollution, health problems (e.g. asthma), accidents, increased journey times, noise and visual pollution, loss of habitats, cost of fuel...etc.*

Therefore traffic management strategies are used to reduce the risk of traffic congestion.

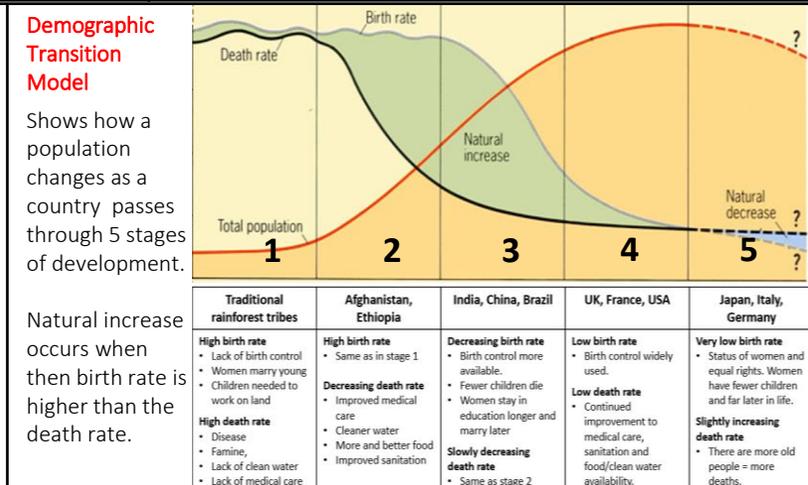
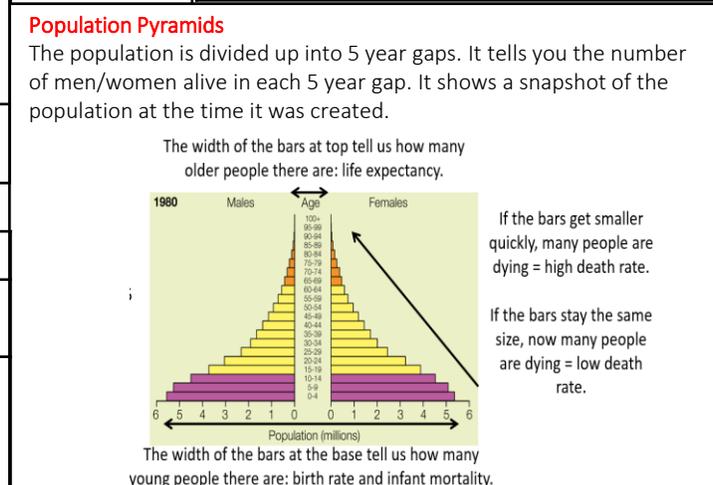
	EXAMPLES IN FREIBURG	EXAMPLES IN LONDON		
SUSTAINABLE WATER SUPPLY AND USE	<p>Collecting and recycling water:</p> <ul style="list-style-type: none"> • Water harvesting systems collect rainwater to reuse. • Water from the River Dreisam is used in Freiburg. <p>Prevent overuse of water:</p> <ul style="list-style-type: none"> • Dual flush toilets are used that use less water to flush. • Water meters remind residents how much water they are using = people use less water. 	<p>Many homes in London use:</p> <ul style="list-style-type: none"> ➤ Water meters ➤ Dual flush systems ➤ Eco friendly appliances that use less water (e.g. washing machines, dishwashers) 	Cycle routes	<p>Lanes along main roads where people cycle, with some new cycle paths that exclude cars (cycle superhighways). There are many benefits of cycling.</p> <ul style="list-style-type: none"> • Increase exercise, improve health, reduce air pollution, reduce stress, reduce congestion. <p>The number of people cycling in London has increased from 1% to 15% in the past 50 years. To encourage more people to cycle London has: <i>made 20mph speed limits, created cycle superhighways (separate lanes for cyclists so they don't need to cycle on main roads), Boris bikes (cycle hire scheme).</i></p>
SUSTAINABLE ENERGY SUPPLY AND USE	<p>Freiburg plans to be 100% powered by renewable energy by 2050. This will require many residents to half their current use of energy.</p> <p>Renewable energies</p> <ul style="list-style-type: none"> • It is one of the sunniest cities in Germany so solar power is used. There are approximately 400 solar panels installations in the city, including at the railway station and football stadium. These produce 10 million kilowatts of electricity per year. <i>Freiburg's solar valley employs 1000 people in solar technology, in the production of solar panels, developing solar technology, such as solar cooling technology.</i> • Other renewable energies that Freiburg uses include biomass and biogas. <p>Prevent overuse of energy:</p> <ul style="list-style-type: none"> • The government provide incentives to encourage people to become more energy efficient, by allowing homeowners to sell any excess energy to the national grid. 	<p>Many energy companies provide energy from only renewable sources (e.g. ecotricity).</p> <p>Many homes and businesses have solar panels on their roofs.</p> <p>Many homes use energy meters to monitor their energy use.</p>	Bus	<p>Buses have been improved to make journeys shorter & more enjoyable = more people to use public transport.</p> <ul style="list-style-type: none"> ➤ 2600 hybrid buses are used in London (reduce emissions by 30-40%) ➤ Information boards used at >2500 bus stops that tell customers when the next bus is due – makes it easier for passengers. ➤ New bus routes and more buses used at peak hours. ➤ Buses have priority = quicker journey times.
			Park & ride	<p>People park their car in free car parks on the outskirts of the city and then take the bus into the city centre. One bus with 40 passengers causes less congestion than 20 cars with 2 people in each</p> <p>They have social, economic and environmental impacts: <i>Less cars in the city = less congestion = less pollution (air, visual, noise), less time wasted in traffic, less accidents, less space needed in the city centre for car parks.</i></p> <p>London has 55 park and ride car parks on the outskirts of the city (e.g. Stanmore (450 spaces) and High Barnett (155 spaces).</p>
			Integrated transport system	<p>A system that links different forms of public transport to make journeys easier = more people use public transport = less cars = less congestion and pollution.</p> <p>Passengers are able to use oyster cards and bank cards to pay for journeys on all forms of public transport = easy to use = more people use it. <i>e.g. Waterloo station connects trains, tube, buses, cycle routes to each other.</i></p>
URBAN GREENING	<ul style="list-style-type: none"> • Afforestation – 75% of the deforested trees are re-grown every year. • River Dreisam provides natural habitats for animals and vegetation. • 44,000 trees have been planted in the city = 40% of the city is 	<p>47% of London is green space.</p> <p>There are 700 roof gardens in London</p> <p>Central London parks: <i>Regents Park,</i></p>		

Development	The process of change for the better
Development Indicator	A measure of development (e.g. birth rate, death rate, infant mortality rate, literacy rate)
Gross National Income	Total income of a country (<i>including</i> money earned overseas).
Gross Domestic Product	Total income of a country (<i>excluding</i> money earned overseas).
Human Development Index	Used by the UN to determine development. It uses <i>quality of education (number of years in school), life expectancy and GNI</i> .
Why is it important to use more than one indicator?	<ul style="list-style-type: none"> ➤Averages are not always reliable as there are inequalities within a country's population. <i>Not everyone earns the same = GPD per capita is not accurate.</i> ➤Anomalies could give inaccurate results. ➤HICs sometimes have a high death rate as their population is elderly.

REDUCING THE DEVELOPMENT GAP		
Aid	A country receives help. It is spent on development projects, for example constructing schools to improve literacy rates, building dams and wells to improve access to clean water. <i>They can stop being effective due to corrupt government or lack of continued funding.</i>	<i>Oxfam's Goat Aid: families are given a goat. It produces milk which can be sold, it's manure can be used as fertiliser, goats bred easily = baby goats (kids) can be sold or eaten.</i>
Debt Relief	HICs reduce the amount of money LICs/NEEs have to pay back = money can be used to develop country (education, water, sanitation). <i>LICs are reliant on HICs.</i>	<i>In 2006, the International Monetary Fund cancelled the debt owed by the poorest 19 LICs.</i>
Investment	TNCs open factories/offices in LICs due to cheap labour. It helps LICs with employment, income and accessing resources. <i>Much of the money goes abroad.</i>	<i>Shell and KFC in Nigeria. Also more than 2000 Chinese companies invest billions in Africa.</i>
Microfinance Loans	Very small loans given to locals in LICs to start small businesses. They help the economy to grow and employment rates to rise. <i>Small scale solution.</i>	<i>Grameen Bank in Bangladesh offer low interest loans of \$100 to develop small businesses. The bank has lent \$11 billion.</i>
Intermediate Technology	Countries and NGOs develop simple, easy to learn, cheap technology to help improve LIC businesses.	<i>Practical Action built an earth dam in Ethiopia = creating a reservoir, providing water for irrigation during the dry season = crops grown.</i>
Fair Trade	<ul style="list-style-type: none"> • Ensures farmers get a fair price for their crops • Invests money in local communities. 	<i>Joins up small farms in Uganda to form co-operatives = farmers save money as they are buying and selling products in larger amounts</i>
Tourism	<p>Jamaica is located in the Caribbean. It suffers from slow development, debt and unemployment. Tourism is one of the main sources of income, with over 1.9 million visitors/yr. People visit Jamaica due to its tropical climate, sandy beaches, exotic wildlife, oceans and for adventure (deep sea diving). Tourists have a good and bad impact.</p> <ul style="list-style-type: none"> ✓ 24% of its GDP is from tourism (\$2 billion per yr) ✓ Higher incomes = more tax to spend on services ✓ 200,000 jobs ✓ It has improved Jamaica's infrastructure. 	<ul style="list-style-type: none"> ❖ Most of the profits go abroad ❖ Tourists harm ecosystems – coral reefs are damaged and pollution from development. ❖ Jobs are seasonal

CAUSES OF THE DEVELOPMENT GAP – some countries are more developed than others.	
Physical reasons	<ul style="list-style-type: none"> • Extreme climates in LICs = crops cannot be grown if it is too hot/cold or dry/rainy = LICs have fewer goods eat or export = government gets less taxes. • Landlocked countries (no coastline), find it more difficult to export goods. • Countries with many natural hazards (e.g. Philippines, Bangladesh) have to spend a lot of money rebuilding and so have less money for development.
Economic reasons	<ul style="list-style-type: none"> • Countries with poor trade links find it difficult to make as much money. • LICs sell cheap primary goods and buy expensive secondary goods, whereas HICs sell expensive secondary goods and buy cheap primary goods. • Countries with lots of debt have less to spend on developing their country.
Historical reasons	<ul style="list-style-type: none"> • Countries that were colonized (ruled by a foreign country) are often at a lower level of development. European countries colonized much of Africa in the 19th Century. They controlled the economies of their colonies, removed raw materials and slaves, and sold back expensive manufactured goods. This was bad for African development as it made parts of Africa dependent on Europe and led to famine and malnutrition.
Conflict	<ul style="list-style-type: none"> • War can slow development. It kills people = higher death rate. Money is spent on the military and weapons instead of infrastructure and education.

IMPACTS/EFFECTS OF THE DEVELOPMENT GAP	
Wealth	The USA's share of global wealth is 35%. Africa's share of global wealth is just 1%.
Health	There is a higher death rate and lower life expectancy in LICs : <i>The UK's life expectancy is 81 years, whereas Chad is 51 years.</i> Infant mortality is much higher in LICs than HICs.
Migration	People leave voluntarily (e.g. for a job or family) or are forced (war). An economic migrant is someone who chooses to leave. A refugee is someone who is forced to leave. Mexico (NEE) borders the USA (HIC). Every year 130,000 Mexicans move to the USA legally and 1000s more illegally to seek for better paid jobs and higher quality of life.



NIGERIA IS A NEWLY EMERGING ECONOMY.			NIGERIA'S ECONOMY	
Location	North of the equator in west Africa. It borders four countries (Chad, Cameroon, Niger and Benin). The Atlantic Ocean is found along its southern coastline. Its two largest cities are Abuja and Lagos.		What does Nigeria's economy look like?	Most of Nigeria's income comes from the primary sector (oil extraction, farming), however the secondary and tertiary sectors are rapidly growing.
Population	182 million. Since 1990 the number of people living in cities has increased to over 87 million people.	Nigeria imports....	Telephones, cars, rice and wheat to China, EU, USA, India, Japan	
Nigeria is considered important because...	<ol style="list-style-type: none"> 1. It has the fastest growing economy in Africa. In 2014 it became the world's 21st largest economy. 2. It has the highest agricultural output in Africa, employing 70% of the population. 3. It supplies 2.7% of the world's oil, making it the 12th largest producer. 4. Political global links, working with the UN within peacekeeping. 5. It is a role model for other African countries who hope to develop. 	Nigeria exports....	Oil, agriculture – rubber, cocoa, cotton to EU, USA, China, India, Indonesia, Brazil	
Nigeria's context		What does manufacturing in Nigeria look like?	Nigeria is industrializing. Currently 10% of Nigeria's economy comes from manufacturing. It is the fastest growing economic sector in Nigeria due to the cheap labour force and improved infrastructure. They make processed foods, clothes, soaps and detergents and leather items.	
Social	<ul style="list-style-type: none"> ➤ Multi-ethnic – there are many groups of people who identify with different cultures and traditions (e.g. Yoruba, Hausa and Fulani, Igbo) ➤ Multi-faith – there are many religious groups (e.g. Christianity, Islam and traditional African religions). This social diversity has often resulted in conflicts between different groups.	Why has Nigeria's economy changed?	<ul style="list-style-type: none"> • Increased used of farm machinery and better pay/better working conditions in manufacturing industries = decline in primary sector. • A more stable government = rise in investment from HICs and TNCs move their factories to Nigeria = rise in secondary manufacturing. • Improved trade links and increased number of people who speak English = increase in telecommunications, finance (tertiary sectors). 	
Political	Prior to 1960 Nigeria was a British colony. In 1960 it gained independence. Until 1970 there were power struggles and civil wars as groups tried to gain power. Since 1999 it has had a stable government = lots of foreign investment.	Multiplier effect	When one change = more changes.	
Environmental	North: savannah and semi-desert. In the savannah lots of farming occurs (cattle, cotton, millet). Drier in the north. South: rainforest. High rainfall and temperatures. Crops – rubber, cocoa, oil palm. It suffers from the tsetse fly so not many cattle.	How has Nigeria's economic change benefitted Nigeria?	<ul style="list-style-type: none"> • Better and more regular wages = more disposable income = more money spent in local businesses = improved local economy. • Increase in employment and wages = increase in taxes = government has more money to develop healthcare, education, access to food, services & clean water = <ul style="list-style-type: none"> > life expectancy increased from 46 years in 1990 to 52 years in 2013 > death rate decreased from 213 per 1000 people in 1990 to 117 per 1000 people in 2013 > % of population with safe water increased from 46% in 1990 to 64% in 2013 • Successful factories = increase in foreign investments who want to open factories in Nigeria = more jobs = further ec. growth. • In 2000 Nigeria was among the least developed nations in terms of wealth and education. In 2011 Nigeria has one of the highest HDI improvements in the world over the last decade. 	
Cultural	Rich culture with famous authors (Wole Soyinka), footballers, musicians (Fela Kuti) and film industry (Nollywood).	How are Nigeria's links with the wider world changing?	<ul style="list-style-type: none"> • Nigeria now plays a larger role in international politics. • Nigeria has better trading relationships 	
Links with the wider world – Nigeria is linked with a number of African and global groups.		Has development benefited Nigerians?	<ul style="list-style-type: none"> • Not everyone. • 60% of Nigerians (100 million) live on less than 1\$/day, with limited access to clean water, sanitation or reliable electricity. 	
Commonwealth	It has equal status with all countries in the commonwealth, including the UK	What must Nigeria do to further develop?	<ul style="list-style-type: none"> • Nigeria must have a consistently stable government to increase foreign investment. • Nigeria must gain peace between religious and ethnic groups to avoid conflict • Nigeria must impose sanctions to avoid future oil spills in the Niger Delta. 	
African Union	Economic planning and peacekeeping group with Niger, Chad, Benin and Cameroon. It provides troops.			
United Nations (the UN)	In 2013 Nigeria was the 5 th largest contributor of troops for peacekeeping.			
ECOWAS	Economic Community of West African States is a trading group			
CEN-SAD	Community of Sahel-Saharan States is a trading group.			

Negative environmental impacts of rapid economic development		
Industrial Growth. More specifically.....	An increase in factories and industrial plants due to industrialisation. As a result.....	<ul style="list-style-type: none"> Water pollution caused by chemical waste from factories in Kaduna, Kano and Lagos. Air pollution caused by factories releasing harmful gases into the atmosphere.
Growth of oil extraction. More specifically.....	TNCs, such as Shell Oil, drill for oil in the Niger Delta. It is Nigeria’s main source of income. As a result.....	<ul style="list-style-type: none"> Oil spills in Niger Delta = fires, air pollution, acid rain, water pollution...etc. For example Bodo Oil Spill (2008-9) Leaks in a pipeline = 11 million gallons of crude oil to spill over the land. Farmers and fishermen lost their livelihoods. In 2015 Shell agreed to pay £55 million in compensation to be spent on health clinics and schools.
Urban Growth. More specifically.....	Increase of people moving to urban areas due to growth of secondary industries (factories) <i>industrialisation</i> . As a result.....	<ul style="list-style-type: none"> Not enough houses = squatter settlements are formed. Not enough services or waste disposal = unhygienic rubbish on ground. Not enough roads = traffic congestion and pollution.
Growth of commercial farming. More specifically.....	Large farms are created to grow crops to export. This is the main source of employment in Nigeria. As a result.....	<ul style="list-style-type: none"> 70-80% of Nigeria’s forests have been deforested = many species have disappeared (<i>cheetahs and giraffes and nearly 500 types of plants</i>) Farming has caused land erosion and groundwater pollution due to harmful chemicals leaking into soil and river channels.

TRANSNATIONAL CORPORATIONS IN NIGERIA HAVE INCREASED DUE TO GLOBALISATION.

TRANSNATIONAL CORPORATIONS IN NIGERIA HAVE INCREASED DUE TO GLOBALISATION.		Aid in Nigeria	
Globalisation	The increase in links between countries, made easier by improved communications (internet, smart phones) and transport (airplanes, ships).	Types of aid	<ul style="list-style-type: none"> Emergency aid: aid given immediately after a disaster or war (e.g. food, shelter, medical supplies) Developmental long-term aid: aims at improving quality of life over a longer time (e.g. WaterAid, schools, roads, electrical supplies)
Transnational corporations (TNCs)	A company that has offices/factories in several countries. There are around 40 TNCs in Nigeria, such as KFC, Unilever and Shell Oil.	Aid can be given by....	<ul style="list-style-type: none"> Rich individuals, charities and non-governmental organisations (NGOs) (e.g. Oxfam, WaterAid) Governmental aid from countries (e.g. UK, USA) and International Organisations (e.g. World Bank, International Development Agency (IDA))
Example of TNC in Nigeria	Shell Oil is an Anglo-Dutch company with its headquarters in the Netherlands. It has been extracting oil from the Niger delta since 1958.	Why does Nigeria need aid?	<ul style="list-style-type: none"> 60% of Nigerians (100 million) live on less than \$1/day (£0.63p/day). Nigerians live with limited access to clean water, sanitation and electricity. Birth rates and infant mortality rates are high and life expectancy is low.
Advantages	<ul style="list-style-type: none"> <i>Jobs. Shell provides 65,000 jobs and a further 250,000 jobs in related industries (e.g. companies who make parts for the oil rigs)</i> People have a more reliable income to spend in local shops = boosts local economy. Country earns money from increased exported goods and increased taxes. TNCs often invest in the local infrastructure and education. 	This is due to...	<ul style="list-style-type: none"> ➤ Corruption by individuals or the government = money is diverted by the government to other projects (e.g. the military or navy) ➤ People give aid but insist on where it is spent. This is not always in the best interest of the people.
Disadvantages	<ul style="list-style-type: none"> Working conditions/wages are bad. Workers work long hours. Oil spills = water pollution = reducing crop production and fishing yields. Much of the profits generated goes abroad to the country where the TNC has their headquarters. Oil Theft and sabotage are big problems in the Niger delta. 	Examples of aid in Nigeria:	
		The World Bank	Gave \$500 million to fund long term business loans in 2014.
		Nets for Life	Provide education and mosquito nets to help prevent malaria.
		UK	Provide a health and HIV programmes, providing health education in rural areas.
		USA	Provide education and protection against the spread of HIV/AIDS.
		Aduwan Centre	In 2010, northern Nigeria, ActionAid and the World Bank, built a new health clinic. This supported people by: <ul style="list-style-type: none"> Local women were trained to educate mothers about the importance of immunising their children against polio and other diseases. <i>Develops skills and knowledge, long term, helps important problem, involves local community</i> Tests for HIV and immunises children against polio. <i>Helps important problem.</i>

THE UK'S ECONOMY		Economic Sectors	
How has the UK's economy changed?	<ul style="list-style-type: none"> ➤ 1600s: primary (farming) ➤ Late 18th century: industrialisation resulted in the rise of secondary factories (manufacturing). ➤ 1950s: de-industrialisation = decline in factories & manufacturing. ➤ 1970s: post industrial economy. Most people work in tertiary and quaternary sectors. This was created after de-industrialisation occurred in the 1950s. 	Primary Extraction of raw materials (agriculture, mining, fishing)	
		Secondary Manufacturing of raw materials (food processing, clothes, oil refinery)	
		Tertiary Selling of services and skills (education, health service, transportation)	
		Quaternary Information and research services (ICT, computing, research, consultancy)	
Why did the UK's economy occur?	Factories moved abroad because: <ul style="list-style-type: none"> ➤ It is cheaper and there are less strict environmental laws. ➤ Improved international trade links (EU, WTO) makes it easier to do trade between countries. 	Rural Populations in the UK - 19% of the UK's population live in rural areas. This is constantly changing. Changes in the UK's economy is causing changes in rural landscapes.	
Essentially, why did de-industrialization occur in the UK?	<ul style="list-style-type: none"> ➤ Improved transport links makes it easier to trade between countries. ➤ Improved communications and IT. The internet = people can store information online which can be accessed anywhere in the world 	Rising rural populations Positive impact: Negative impact	Counter-urbanisation (urban to rural migration) has been made possible by improved transport links. People are able to commute from rural areas near cities to urban areas for work (e.g. South Cambridgeshire). <ul style="list-style-type: none"> • Rural businesses do better due to increase in customers, schools have more students. • Increase in congestion, petrol prices rise due to higher demand, house prices increase due to higher demand, loss of greenfield sites due to new developments.
What does the UK's post industrial economy look like?	Tertiary and quaternary industries are growing. In 2011 they employed 81% of the UK's workforce – and this proportion is increasing. Important industries include: <ul style="list-style-type: none"> ➤ Services (tertiary) – retail, entertainment. Retail is the UK's largest sector employing 4.4 million people. ➤ Finance – the UK is home to many global financial institutions like HSBC and Barclays. It employs 1.1 million people in high paying jobs. ➤ Research – research and development is increasing in the UK, hiring highly skilled university graduates. ➤ Information technology. Over 60,000 people are employed in the IT sector in companies such as Microsoft and IBM. 	Declining rural populations Positive impact: Negative impact	Outward migration has occurred in some regions such as the Outer Hebrides. People are leaving due to a lack of jobs in agriculture. They leave to look for jobs and entertainment. The population of the Outer Hebrides has declined by 50% since 1901. <ul style="list-style-type: none"> • Tourism opportunities as people go to outer Hebrides for peace and quiet and walking. • Lack of customers = shops close down, lack of students = schools close down, younger people move away = an elderly population.
		The UK has developed its national and international transport links. This has a number of positive and negative impacts on the UK's economy and people.	
Tertiary sector earns:	79% of the UK's GDP	ROADS Positive impact: Negative impact:	Added 100 new roads and 100 miles of new lanes They have also created smart motorways (e.g. M4), which have varying speed limits & extra lanes. <ul style="list-style-type: none"> Reduces congestion and reduces journey time. Encourages people to drive = more pollution. Extra lanes = loss of habitats.
The Quaternary sector earns:	£3 billion/year. It employs 75,000 highly qualified people.	RAIL Positive impact: Negative impact:	Cross rail: railway from east to west London. They expect 200 million people to use it. <ul style="list-style-type: none"> It will reduce congestion on trains with some people using cross rail instead of tubes. It will also bring an additional 1.5 million people within a 45 minute commuting distance from London's business districts. It will cost £14.8 billion. High Speed 2: rail line from London to the midlands and north. <ul style="list-style-type: none"> Reduces journey times by up to half the time, helps businesses in the north, reduce congestion on the roads. It will cost £42 billion, will cause visual/noise pollution and affect airlines as more people use the train.
Science/Business Park	A site on which high-tech industries carry out scientific research.	AIRPORTS Positive impact: Negative impact:	Plans to build a 3 rd runway at Heathrow Airport . <ul style="list-style-type: none"> Boost economy by over £200 billion, improve UK's global links, provide jobs (Heathrow employs 76,000 people). It will cost £18.6 billion, cause pollution (air, visual, noise) & villages will be relocated
Science park are located.....	On the outskirts of urban areas, such as Cambridge Science Park opened in 2014. It is home to 1500 IT biotechnology companies.	PORTS Positive impact: Negative impact:	London Gateway Port opened in 2013. It can accommodate the largest ships (up to 400m long and carrying 18,000 containers!) Ports transport goods & people (32 million passengers travel through UK ports each year) <ul style="list-style-type: none"> It will employ 8000 ppl in the port & next door logistics park. It boosts the UK's economy through import/export. It will increase congestion in the surrounding area.
Why are they located there?	<ul style="list-style-type: none"> • Good transport links near motorways or airport. • Highly skilled graduates from universities • Close to the city – shops, entertainment options, housing • Edge of the city so more green space and cheaper rent. 		
Some disadvantages are...	<ul style="list-style-type: none"> • City can be overcrowded/congested • House prices are expensive in cities 		
Why are the number of Science parks increasing?	<ul style="list-style-type: none"> • There is a large and growing demand for high-tech products. Science parks develop new technology for these products. • The UK has a high number of strong research universities for businesses on science parks to form links with. 		

EXAMPLE OF A MODERN INDUSTRY: CAR MANUFACTURING, for example JAGUAR LAND ROVER

Many UK industries have factories in LICs and NEEs due to cheap labour. There are, however, still some remaining industries in the UK. The car industry is one of the few large-scale manufacturing industries left in the UK. More than 1.5 million new cars are made in the UK every year (e.g. Jaguar Land Rover).

How does the car industry harm the environment?

Manufacturing	<ul style="list-style-type: none"> Cars are made from steel, rubber, glass, plastic...etc. Making these uses energy = pollution. A huge amount of energy is used to manufacture a car. To generate this energy, pollution is created.
Lifetime	<p>Most cars run on petrol or diesel. Both are made from oil.</p> <ul style="list-style-type: none"> Drilling and transporting oil can result in oil spills. Using petrol or diesel in cars causes air pollution (carbon dioxide & nitrogen dioxide).
Disposal	Cars usually end up on the scrapheap. Acid in the car batteries can leak into the ground and harm ecosystems.

How can the car industry be more sustainable?

Manufacturing	<ul style="list-style-type: none"> The 2003 Government’s ‘End of Life Vehicle’ regulation requires manufacturers to recycle parts = less new materials need to be made = less energy used. Jaguar Land Rover’s factory in Wolverhampton uses natural cooling and natural light to reduce energy use. It has solar panels on its roof, which generates 30% of the factory’s electricity. Finally almost all waste is recycled.
Lifetime	Electric and hybrid cars have been developed (e.g. Nissan Leaf) that use electricity to power the car till 30mph and then petrol/diesel after = less pollution. Also they are lighter and so burn less fuel when driving.
Disposal	The 2003 Government’s ‘End of Life Vehicle’ regulation requires manufacturers to take back vehicles that are at the end of their life and dispose of them in an environmentally friendly and safe way. As a result less waste goes to the landfill.

HOW IS THE UK LINKED WITH THE WIDER WORLD?

Commonwealth	<p>The British Empire once covered 1/3rd of the world. During the late 20th century, most countries gained independence = the creation of the COMMONWEALTH: a group of 53 countries, including India and Canada. The UK maintains its links with Commonwealth countries through trade, migration and culture.</p> <ul style="list-style-type: none"> Countries meet every 2 years to discuss current issues. The UK trades with other Commonwealth countries. Many people of British descent now live in Australia and Canada. The Commonwealth Games is held every 4 years.
How does this link the UK with the wider world?	
Transport	<ul style="list-style-type: none"> Airports connect the UK with many countries: <i>Canada, USA, South Africa, Singapore and India.</i> The Channel Tunnel is a railway line that connects the UK & mainland Europe. These have helped import/export routes, as well as made it easier to travel for UK citizens. Having said that, they are incredibly expensive to develop.
Communication	<p>The internet is the biggest contributor to the UK connecting with other countries. It has had a huge impact on businesses and our economy.</p> <ul style="list-style-type: none"> In 2013, on average 183 billion e-mails were sent and received each day. This is 2.1 million every second. In 2014 90% of people in the UK used the internet, compared to just 27% in 2000.

THE NORTH – SOUTH DIVIDE

The cultural and economic differences between the north and south of England.

Evidence of the north – south divide	<ul style="list-style-type: none"> On average in the south, there is a longer life expectancy, more jobs, higher wages, higher house prices . <i>In 2014, wages were on average 40% less in Huddersfield (north) than London.</i> <i>2012 life expectancy in Glasgow (north) was 72years, in East Dorset (south) was 83 years.</i>
Why does the divide exist?	<ul style="list-style-type: none"> The lack of employment in the north is partly due to de-industrialisation. There were more factories and coal fields in the north. As a result, when these closed down during de-industrialisation, widespread unemployment occurred in the northern cities. There are more jobs and higher wages in the south due to the creation of a post industrial economy. London is the UK’s financial centre and heart of the post industrial economy. Many tertiary and quaternary jobs (with high wages) are in urban areas in the south.
How are they reducing the divide?	<ul style="list-style-type: none"> Investment in transport connecting the north with south and wider world (HS2, new ports, smart motorways) = better links for businesses in the north helping them to make more money and employ more people. Scotland, Wales and Northern Ireland have their own governments that decide how money can be spent to best improve the local economy and quality of lives. Investment from government and EU to improve businesses and encourage TNCs to open factories in the north (<i>Nissan opened car manufacturing plant near Newcastle in 1984</i>). Local Enterprise Partnerships (LEPs) are created to help local businesses succeed. There are 55 Enterprise Zones in the UK which reduce business tax, make planning rules simpler or improve local infrastructure to help businesses succeed = boost local economy. This will create new jobs, improve infrastructure and develop area).

Trade
European Union
How does this affect the UK?
Brexit

USA, Europe and Asia are the most significant trading partners. The UK’s overseas exports are worth over £250 billion per year.

In 1973 the UK joined the European Union. The EU is an economic and political partnership. The EU allows the free movement of people, goods and services between the member countries. It is an important trading group with a total of 28 countries, such as France, Italy, Spain, Germany and Belgium.

- It provides a large market for UK businesses to trade with. These links have no trade or political barriers, making it easier and cheaper to trade with. NO trade of political barriers. Over £130 billion of the UK’s exports were to the EU in 2015.
- Financial support for farmers. In 2015, £18 million was used to support dairy farmers in the UK.
- Since the early 20th century, 10 Eastern European countries have joined the EU. Since, many people from these countries have migrated to the UK looking for better paid work. Some people argued this placed pressure on UK services and housing.
- The UK support poorer members by paying more money into the EU.

In 2020, the UK left the EU. Many people believe this will give the UK the opportunity to do new trade deals with countries outside of the EU helping our economy. They also believe we will spend less money helping other EU countries in debt.

WORLD'S ESSENTIAL RESOURCES

<p>Food Food is important because it affects your health. The World Health Organisation says we need 2000-2400 calories per day to be healthy. If you do not have sufficient food you become malnourished or suffer from undernutrition/undernourishment (<i>a poor diet with a lack of nutrients and vitamins</i>)</p> <ul style="list-style-type: none"> • Food surplus: North America, Europe, Australia, Russia, UK, USA • Food deficit: Africa (e.g. Chad, Congo, Ethiopia) 	<p>Water Water is important as we need it for our health and for economic development (agriculture, manufacturing, cleaning, drinking).</p> <ul style="list-style-type: none"> • Water surplus: areas where there is high rainfall and water storage (aquifers/reservoirs). E.g. USA, Canada, Europe, Russia • Water deficit: areas where there is low rainfall and a lack of water storage. E.g. Africa, Brazil, Argentina, Australia, China. 	<p>Energy Energy is important because it is used to build homes, heat homes, power machinery, make food...etc. It is also traded between countries and so helps a country develop.</p> <p>HICs consume (use) far more energy than LICs and NEEs.</p> <ul style="list-style-type: none"> • LICs – use very little energy (few machines, lack of processed foods, few families use power in their homes). • NEEs – use more energy (increase in factories = increased use of machines = more energy used). • HICs – use the most energy (lots of energy used in industries and homes, people eat a lot of processed foods).
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FOOD in the UK		WATER in the UK		ENERGY in the UK	
40% OF FOOD IN THE UK IS IMPORTED.		Water surplus	Areas with high rainfall and low population (<i>Wales & Scotland</i>)	<i>The UK's energy mix is...</i>	<ul style="list-style-type: none"> • 52.6% fossil fuels, 21% nuclear energy, • 24.7 renewable energies
Why?	<ul style="list-style-type: none"> ➢ Food is cheaper to make food in LICs. ➢ Demand for exotic foods (mangoes, bananas) ➢ Demand for seasonal foods all year round. ➢ Some foods cannot be grown in the UK. 	Water deficit	Low rainfall and high population (<i>south east England and parts of central England</i>).	<i>Fossil fuels will be used less because...</i>	<ol style="list-style-type: none"> 75% of oil and gas reserves are gone 100% of coalfields are closed down The EU fines companies who release too many greenhouse gases
Problem:	Increase in food miles (distance travelled by food to our plate) = increase in carbon footprint (the amount of CO2 a country produces).	Water transfer scheme	Water is moved from areas of surplus to areas of deficit. The government proposed a UK wide water grid in 2006, however it was not built due to high costs and impact on ecosystems. Some water transfer schemes do exist.	<i>Renewable energies will be used more because...</i>	The government has been investing in these sources.
SOLUTION		The demand for water in the UK has increased in recent years. In fact households use 70% more water. This is because: <ul style="list-style-type: none"> • More wealth = more household appliances that use water • Population increase & people wash more often 		<i>Fossil fuels will continue to be used because...</i>	<ol style="list-style-type: none"> Coal is cheap to import New nuclear stations and renewable energy infrastructure is expensive
Organic Farming	Small scale farming that produce local, seasonal food without the use of chemicals. <ul style="list-style-type: none"> • Uses natural predators instead of pesticides • Crop rotation is used instead of fertilisers • Grows seasonal food locally. 	HOWEVER ONLY 27% OF WATER IN THE UK IS CLASSIFIED AS CLEAN.		Economic and Environmental impact of each energy type	
<i>Disadvantage</i>	It is usually more expensive because yields are low (less food is produced) and more people are employed, due to lack of machinery used. This means they need to charge a lot to make a profit.	Causes	<ul style="list-style-type: none"> • Fertilizers in farming go into rivers • Chemical waste from factories pollutes rivers • Sewage is pumped into the sea • Oil from cars and boats goes into rivers/sea 	Fossil Fuels	<ul style="list-style-type: none"> ✗ Coal must now be imported from South Africa = expensive ✗ Fossil fuels release greenhouse gases = global warming. The impacts of global warming are expensive to fix ✗ Fossil fuels release greenhouse gases = global warming. ✗ Coal mines need land to be cleared = loss of habitats ✗ Waste from mines = visual and noise pollution ✓ Fossil fuels are reliable and cheap.
Agribusiness	Large scale intensive farms that use lots of machinery and chemicals to increase food production. <ul style="list-style-type: none"> • Hedges are cut down = large fields • Machinery (combine harvester, tractors) • Fertilizers used to add nutrients to the soil • Technology – GM crops, hydroponics, high yielding varieties 	Impacts	<ul style="list-style-type: none"> • Waste from factories = toxic water = harm wildlife & humans • Fertilizers get into water = growth of algae = lack of oxygen and light in the pond = wildlife die (eutrophication) • Bacteria from sewage plants = diseases in river 	Renewable Energies	<ul style="list-style-type: none"> ✗ New infrastructure (wind turbines/solar panels) expensive to build ✗ They are unreliable = often energy must also be purchased. ✗ Wind turbines and solar panels = visual and noise pollution and affect ecosystems. ✓ They do not release greenhouse gases (clean) ✓ Once infrastructure is created, it is cheap to create energy.
Advantage	More food can be produced = less needs to be imported. Use of machinery = fewer people employed = cheap food.	Management	<ul style="list-style-type: none"> • UK has strict laws to control waste production and disposal • Chlorine added to water to remove bacteria. • Water treatment plants remove bacteria, algae and chemicals • Sewage systems are improved (e.g. the Tideway project in London) 	Nuclear Power	<ul style="list-style-type: none"> • Nuclear power stations are expensive to build (£18 billion) • Radioactive waste must be carefully stored = expensive. • Warm waste water can harm local ecosystems • Radioactive leaks harm people and wildlife (e.g. Chernobyl) ✓ It produces very little greenhouse gases ✓ Nuclear energy produces a large amount of energy.
<i>Disadvantage</i>	It can harm the ecosystem due to use of chemicals = water pollution.	Challenges of managing water quality	<ul style="list-style-type: none"> • Growing population = larger farms and more chemicals used. • Economic development = more factories = industrial waste • More fossil fuels burned = more pollution from power stations • Climate change 		

Food consumption	Where food is eaten. High food consumption in HICs (<i>USA, Canada, UK, France</i>) and low food consumption: LICs (<i>many African countries</i>) Future development and population growth will affect food consumption patterns. <ul style="list-style-type: none"> • Countries with increasing populations need more food for the extra people. • As a country develops, people start to eat more meat and processed foods.
Food security	A population has access to safe, affordable, nutritious food to maintain a healthy and active life.
Food insecurity	When a population does not have access to enough safe, affordable and nutritious food.
Undernourishment	A poor diet with a lack of nutrients and vitamin

STRATEGIES TO INCREASE FOOD SUPPLY

The Green Revolution started in the 1960s. Its aim was to increase food supply by using pesticides, Fertilizers and high yielding varieties of seeds. Unfortunately global population grew faster = not enough food produced.

The New Green Revolution was later introduced, which aimed to increase food production at the same rate as population rise through using:

- ✓ GM crops, irrigation, crop rotation and appropriate technologies (strategies that are appropriate to where they are being used)



CAUSES OF FOOD SURPLUS/FOOD DEFICIT

WATER SUPPLY <i>(physical)</i>	<ul style="list-style-type: none"> • Reliable rainfall = food surplus as there is enough water to grow crops. Common in Bangladesh. • Lack of rain (droughts), too much rain (floods) = food deficit as crops as destroyed. Common in Africa. With current rates of climate change, 50% of the world's pop will be living with high water stress by 2030.
TEMPERATURE <i>(physical)</i>	<ul style="list-style-type: none"> • Extreme temperatures = deficit as crops cannot grow. • Mild temperatures = surplus as crops easily grow.
PESTS & DISEASES <i>(physical)</i>	<ul style="list-style-type: none"> • LICs crops are destroyed by more pests and diseases due to their warm climates and lack of pesticides and GM crops = food deficit. Pests include cattle diseases (e.f. Rift Valley Fever) or locusts attacking crops • HICs use GM crops and pesticides = less crops die = food surplus.
POVERTY (human)	<ul style="list-style-type: none"> • LICs cannot afford seeds, technology, irrigation, fertilizer = food deficit. • HICs can afford seeds, technology, irrigation, fertilizers, GM crops = food surplus
CONFLICT (human)	War = food deficit because: <ul style="list-style-type: none"> • Farmers are fighting/not farming. • Political corruption = aid doesn't reach most vulnerable. • Food is used as a weapon and kept from most vulnerable.

Hydroponics
Aeroponics
Advantages

Plants are grown in a nutrient rich water.

Plants are suspended in the air and their roots are sprayed with a fine mist of water and nutrients

- ✓ The plants receive the exact amount of light, water, nutrients, fertilizers and pesticides they need = all crops are healthy and grow quickly.
- ✓ They are grown in tanks, which can be stacked on top of each other = more crops grown in same space.
- ✓ Crops stay fresh for longer as they continue to grow as they are being shipped.
- ✓ It uses less water than traditional farming in soil.

Disadvantages

- ✗ It requires expert knowledge/skills and can be expensive, therefore less suitable in LICs
- ✗ Some consumers say the food doesn't taste as good as traditional farming.




IMPACTS OF FOOD SURPLUS/FOOD DEFICIT

FAMINE & UNDERNUTRITION	<p>Famine: the widespread shortage of food.</p> <p>Undernutrition: the lack of a balanced diet (not enough minerals/vitamins).</p> <p><i>The UN estimates that 258,000 people died in Somalia during the 2010-12 famine. At the worst point, 30,000 people died each month. It was caused due to low rainfall and death of livestock (animals).</i></p>
RISING FOOD PRICES	<ul style="list-style-type: none"> • Shortage of food = increase in demand of food = increase in price of food. • In LICs the shortage of food can cause the price of basic foods (e.g. rice/maize) to become too expensive.
FOOD RIOTS AND SOCIAL UNREST	Shortage of food = increase in price of food = conflict as people fight over food. <i>In 2011, a food riot in Algeria lasted 5 days and killed 4 people. It was because the cost of cooking oil and flour doubled.</i>
SOIL EROSION	Soil erosion is when the top layer of fertile soil is removed by wind or water. It is caused by overgrazing, over-cultivation, deforestation and farming on marginal land. Often people are overgrazing and over-cultivating to increase food supply.

Biotechnology
Advantages

Plants are genetically modified (GM) to make them resistant.

- Resistant to pests, diseases, salty soils, droughts...etc.
- Increase the vitamins in the crops or increase the food's shelf life.

- ✓ The use of GM maize in the Philippines has increased yields by 24%. Increased yields = more products are sold = higher income = people can buy more food.

Disadvantages

- ✗ Environmental: super weeds could develop, resistant to new crops
- ✗ Social: increase in number of allergies in humans since using GM crops
- ✗ Economic: they are expensive and require specialist knowledge therefore not always suitable for LICs.



Irrigation
Advantages

Irrigation is the artificial watering of land. It means that crops always have enough water to grow = increase in crop yields (more crops produced).

- Large scale reservoir and dams. Water from the reservoir is used to irrigate the crops.
- Flood irrigation – the whole field is flooded. Some people do not like it because it can cause waterlogging and uses a lot of water.
- Sprinkler – a sprinkler sprays water over fields.
- Drip irrigation – crops are watered just where the plants' roots are. Water flows through a pipe that had holes in it, every point there is a root. It means water is not overused.

Disadvantages

- ✗ Irrigation can cause salinity – when irrigated water evaporates, leaving behind the salts and minerals on the soils and crops.



STRATEGIES TO INCREASE FOOD SUPPLY SUSTAINABLY
(increase food supply without harming the environment)

<p>Organic Farming</p> <p>Sustainable features:</p> <ul style="list-style-type: none"> ✓ No chemicals are used. ✓ Rainwater is collected and recycled using water harvesting tanks. ✓ Natural predators are used instead of pesticides. ✓ Soil is kept fertile using manure/compost instead of fertilizers. <p>Disadvantage:</p> <ul style="list-style-type: none"> ✗ <i>It is more expensive than mass produced food.</i> ✗ <i>It is small scale. Not a lot of food is produced.</i> 	<p>Small scale farming that produce local, seasonal food without the use of chemicals.</p>
<p>Urban Farming</p> <p>Sustainable features:</p> <ul style="list-style-type: none"> ✓ Economic – people can sell their produce. ✓ Environmental – food does not travel far & brownfield sites are used. <p>Disadvantage:</p> <ul style="list-style-type: none"> ✗ <i>It is small scale. Not a lot of food is produced.</i> 	<p>Gardens are created on unused land in urban areas (allotments). These gardens are used to grow food.</p>
<p>Seasonal Food</p> <p>Sustainable features:</p> <ul style="list-style-type: none"> ✓ Food miles are reduced as food does not travel as far = fewer carbon emissions (reduced carbon footprint). ✓ Boosts local economy as local food is brought. ✓ Less energy is used to grow the food (no additional heat or light is needed). <p>Disadvantage:</p> <ul style="list-style-type: none"> ✗ <i>There is still a demand for exotic food and seasonal food all year.</i> 	<p>Food is only grown in the season it naturally grows in (e.g. strawberries in the summer and apples in the autumn).</p>
<p>Reduce Food Waste</p> <p>Disadvantage:</p> <ul style="list-style-type: none"> ✗ <i>There are a lot of people to educate which can be difficult. Many people do not like to be inconvenienced.</i> 	<p>If less food is thrown away, less food needs to be grown as less is wasted.</p>
<p>Sustainably sourced food</p> <p>Sustainable</p> <p>Disadvantage:</p> <ul style="list-style-type: none"> ✗ <i>Do not buy meat from large scale intensive farms that use chemicals, lots of energy (in heating large indoor spaces) and produce lots of greenhouse gases.</i> <p>Sustainable</p> <p>Disadvantage:</p> <ul style="list-style-type: none"> ✗ <i>Do not buy fish from large scale intensive fish farms that use chemicals, large nets (that catch all species rather than what they want) or that use seabed dredging to collect shellfish. This process lifts up the entire of the seafloor = ecosystems destroyed.</i> 	<p>Educate people about sustainably produced food. This will increase the demand for sustainable food = less demand for unsustainable food sources.</p>

THANET EARTH: A LARGE SCALE AGRICULTURAL DEVELOPMENT

Thanet Earth is located in east Kent, in the south east of England.

What?

- **5 greenhouses** grow seasonal food all year using **hydroponics**.
- Large lights give **artificial sunlight** = longer growing seasons = crops can be grown all year round.
- **Rainwater is collected** into 7 onsite reservoirs for irrigation
- Each greenhouse has its own power station providing its heat & lighting. The energy produced is sold and the waste produced (*carbon dioxide and heat*) is recycled. It is pumped back into the greenhouses to help the plants grow.

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none"> ➤ 500 jobs. ➤ More food grown in UK, therefore less food imported = better food security. ➤ Less imported food = less food miles = less carbon emissions. ➤ Natural predators are used = less chemicals (pesticides) used. ➤ Hydroponics system reduces waste. The exact amount of water, nutrients, fertilisers are used. This means crops grow up to 3 times as quickly = increasing food supply in the UK. 	<ul style="list-style-type: none"> ➤ A large area of green farmland was built on = habitats lost/ecosystem disrupted. ➤ Money goes to large companies rather than local communities. ➤ Greenhouses use artificial lights = very bright = visual pollution. ➤ Energy is used to power the greenhouses, package the food and transport it to the supermarkets = release of greenhouse gases.

THE MAKUENI FOOD & WATER SECURITY PROGRAMME:
A LOCAL SCHEME IN AN LIC/NIC TO INCREASE FOOD SUPPLY SUSTAINABLY

<p>Where?</p>	<p>Makueni is located in south Kenya (east Africa), 200km south east from Nairobi. I has a population size of 885,000 and receives 500mm of rain per year. They grow crops to feed their population (maize, sweat potatoes, millet), however due to a lack of rainfall, poverty, pests and lack of technology they cannot have food insecurity.</p>
<p>What?</p>	<p>In April, 2004, the charity 'Just a Drop' joined forces with the African Sand Dam Foundation and:</p> <ul style="list-style-type: none"> ➤ Built a water harvesting tank on the roof of the school ➤ Built a sand dam.
<p>What is a sand dam?</p> 	<ul style="list-style-type: none"> • <i>A concrete wall is built across a river channel.</i> • <i>During Kenya's rainy season, water rushes down the slopes and picks up lots of sand/sediment. The concrete wall traps the water and sediment behind the wall. The trapped water has less energy = deposition of sediment.</i> • <i>Over the rainy season, more and more sediment is trapped and deposited behind the dam, until eventually the river behind the dam is filled with sand.</i> • <i>The sand is porous/permeable and so allows water to pass through. As a result, the sand behind the dam is saturated with water, acting as a aquifer.</i> • <i>In the dry season the top layer of the saturated sand dries, however the lower layers of sand are still full of water.</i> • <i>Water trapped in the sand can be accessed by pipes and used for irrigation, drinking or cleaning.</i> • <i>None of the water is lost due to evaporation in the hot climate.</i> • <i>It is sustainable because it is cheap, easy and does not require advanced technology or skills.</i>
<p>How did it help?</p>	<ul style="list-style-type: none"> ✓ Crop yields increased as there was a reliable water supply. ✓ Waterborne diseases decreased as the sand filtered the water. ✓ Less time was wasted collecting water from far away streams = more time to study/work. ✓ Children at the schools in Makueni (e.g. Kanyenyoni Primary School (463 students) have access to a clean and safe water supply.