

Toynbee Curriculum

KS3 Knowledge Maps



GEOGRAPHY

Toynbee School



The geography of me

What is geography?

“Geography is the study of the Earth’s landscapes, peoples, places and environments. It is, quite simply, the study of the world we live in.”
 Geography is part of your everyday life; you use it every day without even realizing!

Types of geography

Human geography: The impact of people on the earth
 Physical geography: The natural world without people
 Environmental geography: Human interaction with nature

Where is the UK?



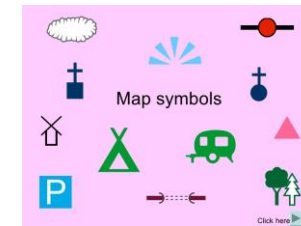
The United Kingdom (UK) is an Island country located in the continent of Europe, it is made up of four countries: England, Scotland, Northern Ireland and Wales.

The UK



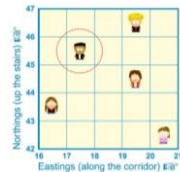
Map symbols

Symbols are useful for lots of reasons including, space saving on a map, multi-lingual (all languages can understand them), saves time, clear.



4 figure grid references

Along the edges of each map there are numbers. These numbers help you work out where a location is on a map. Northings are numbers that go from bottom to top, Eastings go from left to right. Most important corner is bottom left.



The first two numbers give the eastings

32

26

The second two numbers give the northings

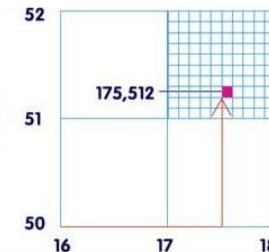
Remember.... eastings then northings! Along the corridor and up the stairs!

6 figure grid references

Same rules as for the 4 fig grid references but this time you read 3 numbers along the bottom and three numbers up the side. Each grid square is divided into 10 “bits”.

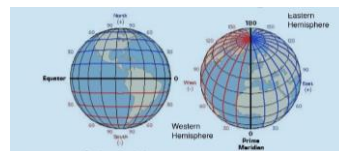
Six-figure grid references

In your head, you should be able to divide all sides of the square into ten equal sections. By doing this, you can pinpoint locations within the square – these are called six-figure grid references.



Latitude and longitude

Unlike grid lines where we go along the corridor and the stairs, here we go UP and ACROSS. Lat and then long, a before o in the alphabet.

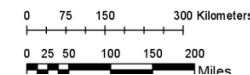


Latitude Flat lines: How many degrees north/south of equator

Longitude Long lines: How many degrees east/west of Greenwich/prime meridian

Scale and distance

OS maps have a scale. On some smaller maps, 1cm on the map equals 250m in real life. On some larger maps, 1cm on the map equals 500m. Different maps might have different scales, so check on your map to find its scale.



Height and relief

Relief: the difference between the highest and lowest heights of an area.

Topography: the surface features of the earth like hills, mountains, valleys

Layer shading

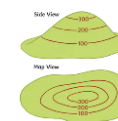
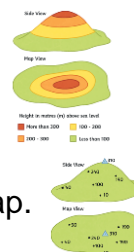
Areas of different heights are shown using different colours.

Spot height

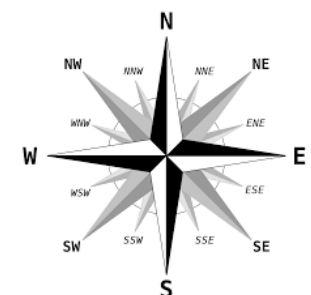
The exact height of a place above the ground is measured and written onto a map.

Contour lines

Contour lines are lines on a map which join up places of the same height. Everywhere along a contour line is the same height.



Compass points



Physical features of the UK

Natural features of the UK include hills/mountains, rivers, lakes and coastlines.

The highland areas of the UK tend to be found in the north (Scotland) and west (Wales) of the country.

These include the North west highlands in Scotland and the Cambrian Mountains in Wales.

The longest river in the UK is the River Severn.



Population of the UK

This is distributed unevenly. Some parts of the UK are densely populated (lots per sq km). Other areas are sparsely populated (not many per sq km)

Reasons for dense population: flat land for building, available resources, close to coast for trade

Reasons for sparse population: Too cold to farm, too steep to build, isolated so trade difficult



Globalisation:

The process by which the world is becoming increasingly interconnected. We now communicate, trade, travel and share each other's cultures.



Southampton docks

Important trade link with rest of world (globalisation)

Creates 15000 jobs in Southampton

Major imports include: metals and cars

Major exports include: machinery, cars and fuels



Country	£bn (% of total trade)
1 United States*	201.6 (15.0%)
2 Germany	136.0 (10.1%)
3 Netherlands	94.7 (7.1%)
4 France	86.0 (6.4%)
5 China	68.3 (5.1%)
6 Ireland	62.5 (4.7%)
7 Spain	50.4 (3.8%)
8 Belgium	48.8 (3.6%)
9 Italy	46.9 (3.5%)
10 Switzerland	34.7 (2.6%)

Rise and fall of Ford

Access: Close to the M27 and M3 so easy to move vans, people and materials

Resources: Close to the motorways and the docks so materials easily accessed. Reliable electricity supply.

Market: Sell to the UK and overseas. Close to the docks to ship vans out.

Labour: Close to Southampton and Eastleigh so lots of workers

Environment: Large area of flat land so easy to build and expand

Closed when the transit manufacture was moved to Turkey in 2013 as it was cheaper

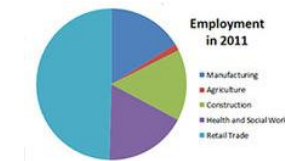
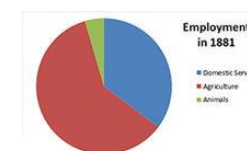
Negative impacts: job losses at the factory and in the supporting industries

Positive impacts: land available for new housing

Employment structure in the UK



Shift from primary to tertiary and quaternary over time as the country developed.



Key terms

Physical geography: natural features or events including landforms or weather

Human geography: concerned with where and how people live

Environmental geography: Human and physical geography linked together. Includes pollution.

Relief: The shape of the land

Topography: the surface features of the earth like hills, mountains, valleys

Population: the people in a place

Population density: number of people per square km

Population distribution: the way the population is spread out

Choropleth map: a map that uses shading to show data

Latitude: distance in degrees from equator

Longitude: distance in degrees from Greenwich meridian

Key terms

Globalisation: the interconnected nature of the world.

Interdependence: the reliance of countries on one another for goods & services

Labour: The workforce in an area

Market: The sum total of all the buyers and sellers in the area.

Deindustrialisation: The reduction of industrial activity in a region or economy.

Imports: products brought into the country

Exports: products sent out of the country.

Trade: the exchange of goods and services

Primary: extracting raw materials e.g. mining and farming.

Secondary: taking raw materials and processing them into manufactured goods

Tertiary: involves the selling of services and skills

Quaternary: information services such as computing, ICT and Research & Development.

Year 7: Wild weather and climate change

Maths in Geography

Climate graph

The bars represent rainfall. This is because rainfall is discrete data. This means that it can be counted over a period of time.

The line graph represents temperature. This is because temperature is continuous data. This means that it can be measured over a period of time.

- How do you work out the average (mean)?

$$\text{mean} = \frac{\sum x}{n}$$

$\sum x$ is sum of all data values
 n is number of data items in sample

- Using your climate graph sheet work out the average:
 - Temperature for each month
 - Average rainfall across the year

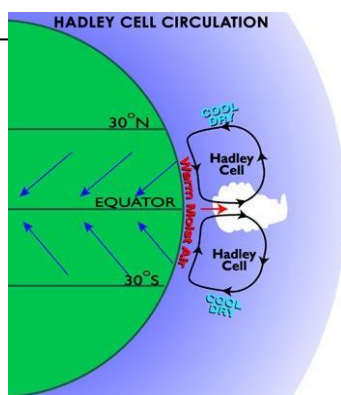
Factors that change our weather and climate.

Latitude: Locations that are further North/South receive less heat energy from the Sun.

Distance from the sea: Coastal areas are most affected by the sea. The sea takes longer to heat up and cool down than land. So in the winter the sea keeps coastal areas warm and in summer, it cools them down.

Prevailing winds: The temperature of the wind and the amount of rainfall partly depend on where the air has come from. Looking at where the air has come from helps to explain the characteristics of the weather.

Altitude: Temperatures decrease with altitude. There is a 1°C drop in temperature for every increase of 100 m in height. This is because the air is less dense in higher altitudes.



Key term	Definition
Weather	The day-to-day condition of the atmosphere
Precipitation	Moisture that falls from the air to the ground. Includes rain, snow, hail, sleet, drizzle, fog and mist.
Evaporation	When water turns from a liquid into a gas.
Climate	Average weather conditions over longer periods and over large areas.
Condensation	When water turns from a gas into a liquid
Climate graph	Show average rainfall and temperatures typically experienced in a particular location.
Anticyclone	High-pressure systems, giving clear skies and gentle wind.
Latitude	Distance from the Equator, imaginary lines around the globe
Prevailing wind	The dominant (main) wind direction in an area.
Altitude	Height above sea level (metres)
Polar Vortex	An area of low pressure and extremely cold air that swirls around the Arctic.
Weather hazard	An extreme weather event that threatens people or property. Weather hazards include: tropical storms. tornadoes. droughts
Climate Change	A change in global or regional climate patterns, due to rising temperatures in the earth's atmosphere
Tornado	A violently rotating column of air that is in contact with the surface of the earth and a thunderstorm in the atmosphere.
Tropical storm	A hazard that brings heavy rainfall, strong winds also called hurricane, typhoon or cyclone.
Coriolis effect	Apparent force, due to the spinning of the Earth, which deflects movement of particles and wind.
Primary impacts	A direct result of a weather hazard.
Secondary impacts	A 'knock-on' effect of a weather hazard.
Global warming	An increase in the overall temperature of the earth's atmosphere
The greenhouse effect	The process that causes the Earth to be warmer than it would be in the absence of an atmosphere.
Carbon footprint	the amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community.
Stakeholders	A person with an interest or concern in something
Mitigation	To make something (bad) less serious ie. reduce the causes of climate change
Adaptation	To adjust or change to cope with different conditions or a new environment ie. deal with impacts of climate change

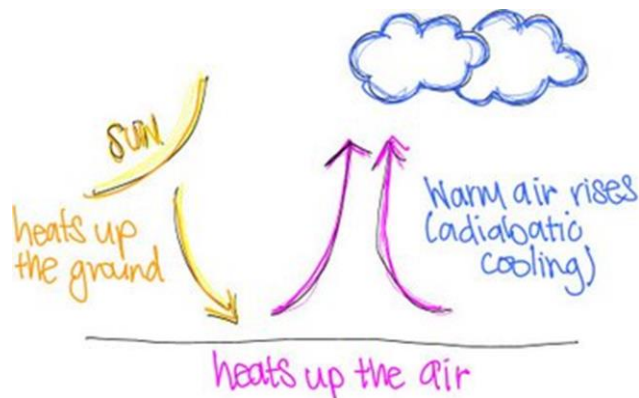
Introduction to weather, climate and air pressure

Difference between weather and climate

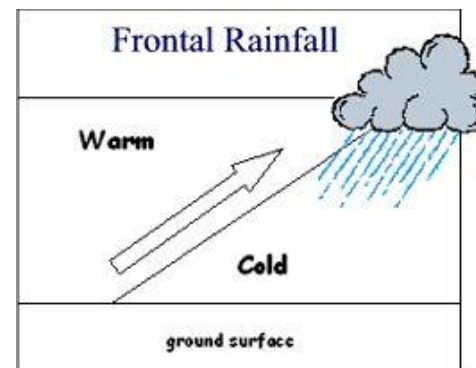
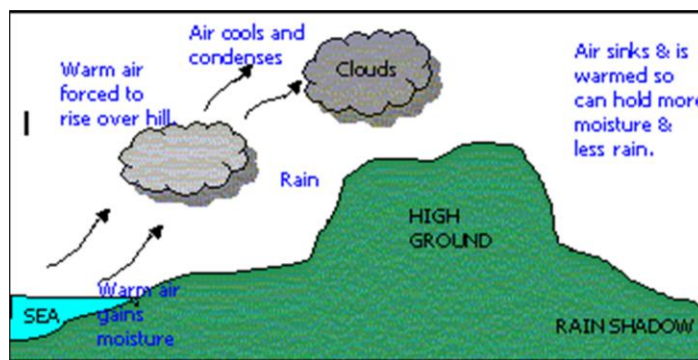
	Summer	Winter
High pressure is where the air is sinking.	High pressure in the summer often brings fine, warm weather. It can lead to long warm sunny days and prolonged dry periods. Could lead to heatwaves and droughts.	High pressure in the winter often leads to cold, dry days, with light winds. Severe nighttime frosts can develop if skies are clear.
Low pressure is where the air is rising.	Leads to periods of prolonged rainfall, which in extreme situations leads to flooding.	Low pressure in the winter often signals stormy or wintry conditions.

Types of rainfall

Convictional rainfall



Relief rainfall



Shivering Chicago: Blizzard 2019

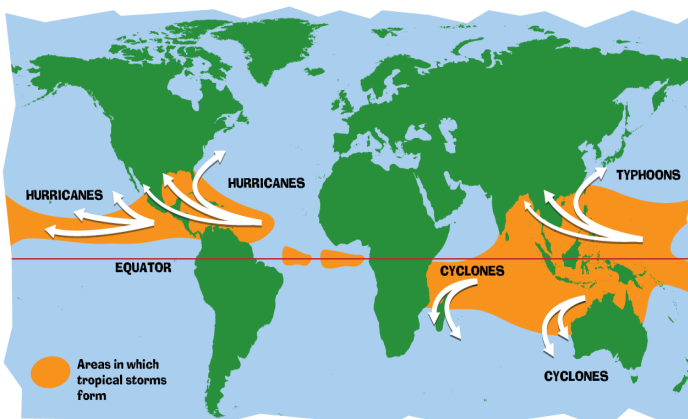
Causes	Impacts	Management
<p>The polar vortex is a mass of cold Arctic air which normally spins around the North Pole. January 2019, the vortex became more irregular in shape, sending freezing cold air further southwards than normal. When this cold, dry air comes into contact with the warmer, wetter air further south=cold low-pressure system.</p>	<p>Temperatures as low as -46C Over 90 million experience below freezing 600 cancellations at the city's airports. Car accidents Lake Erie ice over 80% Hypothermia/frostbite +2,900 flights cancelled Schools/businesses etc. closed</p>	<p>Declared a state of emergency Road closures Snow ploughs Temporary 'warming' shelters Emergency services specialist training in extreme cold weather problems Flights cancelled Setting the train tracks alight to help travelers</p>

Tornadoes: Tornado alley: An area of the USA prone (75% in the Great Plains) to tornadoes every spring.

Causes	Impacts	Preparing/Protecting
<p>Hot sun rays heat the ground this causes the air above the ground to get warmer and rise. When the warm air rises it meets cold air, causing a thunder cloud with thunder and lightening. During the storm there is very rapid movement of air upwards and other circular winds from different directions start to make it rotate. Storms and winds create a swirling funnel that drops to the ground.</p>	<p>Speeds of up to 480km per hour - strong enough to peel the roofs off houses, uproot trees and hurl heavy objects, such as cars, hundreds of metres! 2013 Oklahoma: 24 people killed, 1,150 homes destroyed, \$2billion damages, 37 injured Burst water and gas pipes</p>	<p>Disaster supplies kit Enter basement or interior room Stay under a table If outside in a ditch or low lying area</p>

Features of a tropical storm

- They contain strong winds in excess of 74 miles per hour (119 km per hour)
- Heavy rainfall
- A calm centre called the eye, that is often distinctive in satellite images. It contains calm winds, warm temperatures and clear skies.
- A spiralling cloud formation



Where do tropical storms form?

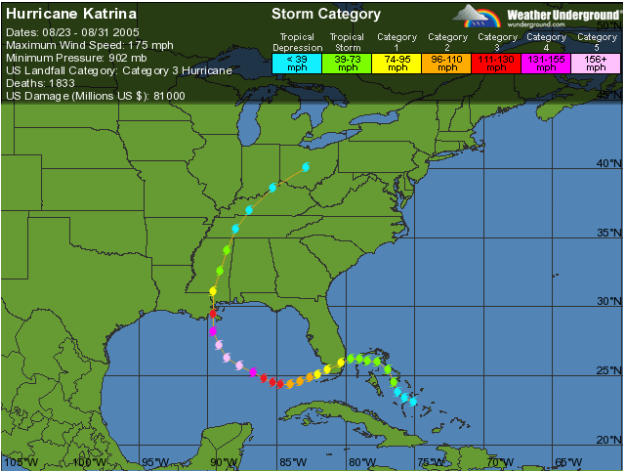
- They form between the equator and tropic of Cancer/Capricorn
- They form to the north and south of the equator
- They mention a specific ocean for e.g. Atlantic
- They mention the proximity to a specific continent e.g. to the east of Asia/North of Australia for

	Hurricanes	Tornadoes
Where do they form	Over water	Over land
How big are they	Can be several hundred miles wide	No more than 1 1/2 miles wide
How long do they last	Up to 3 weeks	Usually no more than an hour
How strong are the winds	Up to 180mph	Severe ones can be up to 300 mph
How many per year	Average of 10 per year in the Atlantic	In the US 800-1000 a year
Advance warning	Several days	Approx 15-30 minutes

Global warming & Tropical storms- as the CO2 levels increase so do the global average temperatures. Tropical storms have become more frequent and intense because oceans are warming and must be above 27C to form tropical storms.

Hurricane Sandy impacted New York, an unlikely location because it is outside the tropics and ocean temps less likely to reach 27c. Global warming made New York vulnerable / at risk of tropical storms because rising temperatures had led to thermal expansion of oceans, rising temperatures to above 27c (key ingredient in tropical storms). Sea levels are also rising mean storm surges are higher and more likely to breach.

Hurricane Katrina



Social

1,836 dead
 10,000 left homeless
 3 million no electricity
 Bridge collapsed
 Crime = reduction in rescue efforts

Economic

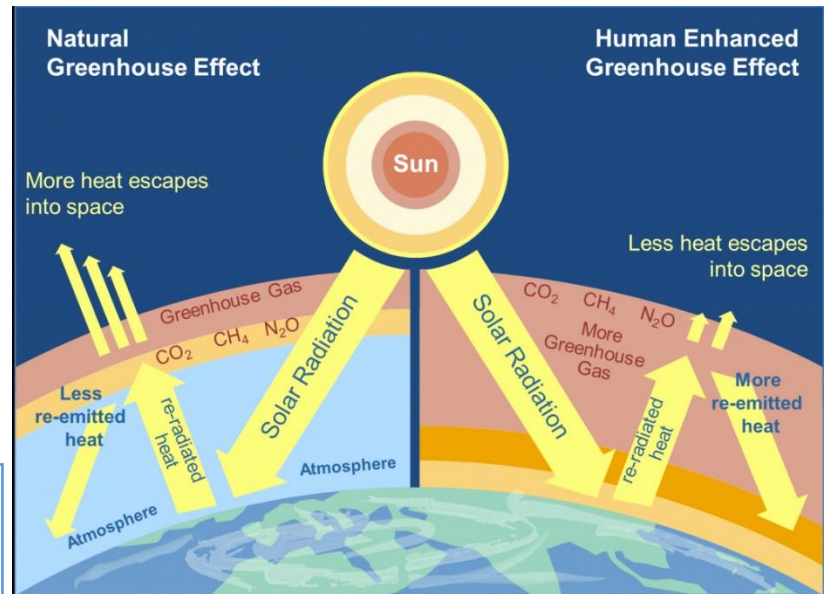
230,000 jobs lost
 Looting of businesses and homes
 The poor hit the worst

Environmental

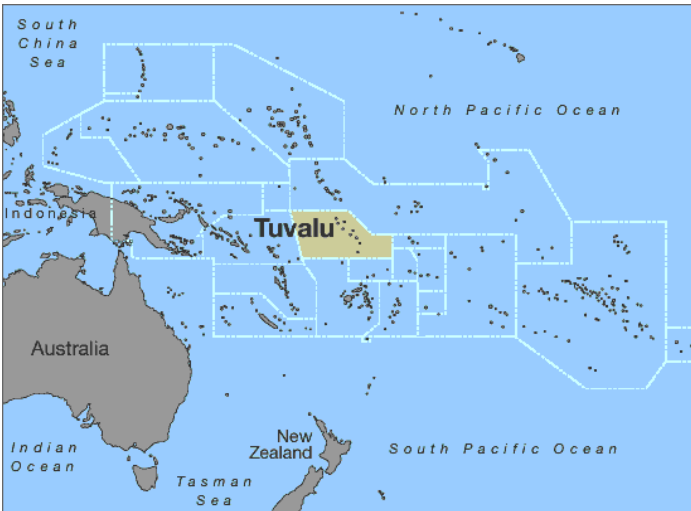
Levees broken in 53 places
 80% of New Orleans underwater
 Water supplies contaminated with sewage, chemicals and dead bodies

Global Warming and Climate Change

Natural causes of climate change	Human causes of climate change
Volcanic eruptions Changes in the earth's orbit Changes in the sun's energy	Enhanced greenhouse effect- use of non renewable energy, deforestation, growing rice, dumping waste on landfill & rearing lots livestock (cow farts)



Tuvalu: Going under- sea level rise



Location: a microstate in Polynesia, located in the Pacific Ocean, situated in Oceania and about midway between Hawaii and Australia.

1. Who is responsible for Tuvalu?
2. How will the people of Tuvalu be affected socially, economically and environmentally?

Tackling climate change

Adapting – managing water supply, reducing risk from rising sea levels, changing housing design (on stilts, grass on roof insulation)
 Mitigating- alternative energy (solar panels on houses, E.G. Bedzed, London), organic farming, replanting trees, international agreements

Case study: Maldives- completely submerged within 50-100years

Population	About 30,000 people
Number of Islands	1190- 199 of which are inhabited
Average island height	1.5 above sea level 80% of the land is below 1m

Stakeholders:

- Hotel manager**- for-relies on tourist for his livelihood
- Conservationist**- for- coral reefs 'rainforests' of the sea- home to thousands of species of plant and animals
- Factory owner in China**- against- Maldives not worth saving at cost of his business producing greenhouse gases
- Dive instructor**- for- loss of income from diving in coral reefs/education of species
- Hotel owner Seychelles**- against- Maldives are competition for tourists(most important sector).

Year 7 - Energy and resources

SOW Learning Map

Key terms

Resource - a source or supply of something from which a benefit is produced

Renewable - a resource which is not depleted when used

Non-renewable - a resource which is depleted when used

Finite - limited in amount or size

Fossil fuel - a resource created from fossils e.g coal, oil or natural gas

Geothermal energy - energy created using heat from inside the earth's crust

Hydroelectricity - electricity generated from moving water e.g 3 Gorges Dam

Biofuel - fuel created from living matter e.g plants

Sustainable - meeting the needs of people, money and the environment, now and into the future

Environment - the natural environment e.g plants, animals, water, soil, air ect

Social - People

Economic - Businesses, jobs and money

Pollution - when harmful substances are released into the environment

Drought - a period of time with below average rainfall/water availability (South Africa)

Famine - a period of time with below average food availability

Eco-town - a town which aims to be sustainable

Coltan - a mineral mined from the ground, used in portable devices (e.g mobile phones) to store battery power

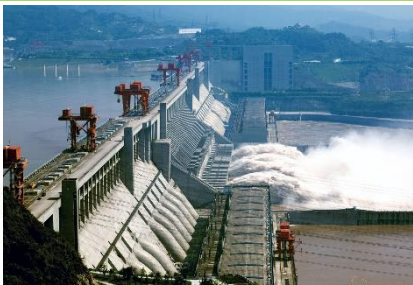
Energy

What types of energy are there?

- Energy is used to create heat or electricity that can be used in several forms.
- These include to power our homes, businesses and transport
- Energy can be classed as **renewable or non-renewable**.
- **Non-renewable** energy includes fossil fuels, which will eventually run out.
- **Renewable** energy includes solar, wind, hydro and geothermal power.

Is all energy good?

- There are advantages and disadvantages to using both non-renewable and renewable energy.
- For example, **oil and natural gas** are easy to transport through pipelines (**TAP**) (+)
- However, these pipelines can break or become damaged, resulting in pollution (-)
- **Biofuel** is good as it only releases the same amount of **CO₂** as it removed from the atmosphere (+)
- However, growing it can take up land which is needed for growing food crops (-)



What is sustainability?

- To be 'sustainable', something needs to meet the needs of people, money and the environment, now and into the future
- Everything has its own level of sustainability. You, your household, a car, a business, a school ect

How do we measure sustainability?

- We can look at and discuss if something is good for people (socially sustainable). Are people happy? Are they involved and informed of any changes? Are they healthy? Are they being listened to?
- We can look at and discuss if something is good for the economy (businesses, jobs and money). Is it going to cost a lot? Does it create or lose jobs? Is it expensive? Is it wasting money?
- We can also look at and discuss if something is good for the environment (environmentally sustainable). Does it cause pollution? Does it encourage people to save energy, or other resources like water?

How can we be more sustainable?

- There are many ways to be sustainable in your everyday life
- Saving energy in your home (which also saves money), buying food locally and not wasting as much, walking instead of driving and recycling your waste when possible are all great examples.
- **Eco-towns** are settlements built to specifically be as sustainable as possible,
- They are designed and built with sustainability in mind.



Resource misuse

How can we misuse resources?

- Around the world, there are lots of examples of how resources are not used sustainably, and are misused
- Water is often wasted through industries such as agriculture
- As a result of this, the price of these resources can increase, and the amount available can decrease, meaning many people cannot access them (**South Africa, Fiji**)

Can we sustainably manage our resources?

- Other resources, such as copper, can be reused, however this is often not sustainable.
- In **Ghana**, e-waste dumps provide many people with jobs, however cause negative impacts on peoples health and the environment
- Coltan is a mineral which is mined in the **Democratic Republic of Congo (DRC)**
- The mines provide thousands of people with a small income, with which they can buy food, medical care and schooling ect
- However, these mines are often run by rebel army groups, who use violence to control people
- Tropical rainforest is also destroyed to create the mines, meaning animals such as gorillas are killed.



Maths in Geography

Percent of Change

$$\% \text{ Change} = \frac{\text{New} - \text{Original}}{\text{Original}} \times 100 \%$$

Reasons for urbanisation

Example: The Caatinga to Brasilia, Brazil

Push factors (negative rural)

- Poor education
- No electricity or computer access
- Crop failure
- Poorly paid farming jobs
- Poor quality, thin soil

Pull factors (positive urban)

- Large and well equip hospitals
- Lots of schools, colleges and universities
- Higher paid jobs
- More variety of jobs

Year 8: Urban world

Key term	Definition
Urban	A built-up area with a high population density and infrastructure of the built human environment.
Rural	The countryside which is a geographic area that is located outside towns and cities
Urbanisation	The movement of population from rural to urban areas
Megacity	Urban area with a population of over 10 million
Squatter settlement	Slum or illegal and often unplanned settlement
Standards of living	An objective (factual) measure of the level of wealth, comfort and access to material goods.
Quality of life	A subjective (opinion) measure of freedom and equality.
Informal jobs	Part of any economy that is neither taxed nor monitored by any form of government
HIC	High income countries
LIC	Low income countries
NEE	Newly emerging economies
Urban forest	A forest or collection of trees that grow within a city
Urban greening	Increased amount and proportion of green spaces within a city
Counter urbanisation	The movement of people from urban to rural areas, normally experienced in HIC cities

Comparing Asia's megacities

Tokyo	BOTH	Mumbai
<ul style="list-style-type: none"> • HIC city • 37.5 million people • Experiencing population decrease • Low rates of air pollution, noise, traffic and crime • Good public transport • Lots of green space • Issues with ageing population • Expensive and small housing 	<ul style="list-style-type: none"> • Original population growth due to fertile soil • Urbanisation (push and pull factors) causes the cities to grow • Well connected port 	<ul style="list-style-type: none"> • NEE city • 20 million people • Rapid population growth • Strong manufacturing industry • Squatter settlements eg. Dharavi with a population of 1 million (1 sq mile) • Poor living standards in slums • Overstretched rail system is very dangerous

Can you locate the 10 biggest **megacities** on a world map?

City	Country	Population	Size (sq km)
1. Tokyo	Japan	37,239,000	8,547
2. Jakarta	Indonesia	26,746,000	2,784
3. Seoul	South Korea	22,868,000	2,163
4. Delhi	India	22,826,000	1,943
5. Shanghai	China	21,766,000	3,497
6. Manila	Philippines	21,241,000	1,437
7. Karachi	Pakistan	20,877,000	803
8. New York	USA	20,673,000	11,642
9. Sao Paulo	Brazil	20,568,000	3,173
10. Mexico City	Mexico	20,032,000	2,046

Dharavi, Mumbai

Opportunities:

- Low rents (£2.20 per month)
- Strong manufacturing industry with products being shipped around the world
- 5,000 businesses and 15,000 single room factories
- High business turnover- £350 million per year!
- 80% of waste is recycled
- Strong sense of community

Redevelopment proposal

Slum Rehabilitation Authority (SRA)-

\$2 billion whole demolition of the slum and replacement with high rise tower blocks

Advantages:

Legal homes, council can collect taxes, better access to clean water and education, sewage pipes

Disadvantages:

Very small accommodation, poor community spirit, poor people unable to pay taxes, loss of ancient fishing village

Challenges:

- High population density- 1 million people per square mile!
- 24% population have access to safe water
- Toxic levels are 3 times more than the safe limit
- Low wages- 80p per day
- 4,000 diseases reported daily

Local based projects (SPARC)-

NGO that supports local people design improvements to the sums

Advantages:

Involvement of locals, adding extra floors to existing buildings to create more space, toilets placed around the slum to improve sanitation, clean water access improved

Disadvantages:

Small scale projects will only help a small amount of people and take a long time

Lagos, a rapidly growing megacity

Location: Nigeria

Population: 14-21 million (estimates)

Olusosun Rubbish Dump

Opportunities

- Lots of facilities eg. Shops, restaurants, bar, cinema, mosque
- Rubbish can be turned into energy
- Lots of items are reused
- Employs 500 workers
- Workers live at the dump, building their homes from scrap material

Challenges:

- Toxic fumes are harmful to the environment and people's health
- Natural gasses build up and can be flammable causing fires
- Workers do not wear protective gear
- Informal workers do not pay tax or receive any employment rights

The future of megacities

6 new megacities by 2030:

- Chicago, USA
- Bogata, Columbia
- Luanda, Angola
- Chennai, India
- Baghdad, Iraq
- Dar es Salaam, Tanzania

Future patterns and trends:

Developed cities (HIC)

- GDP will be 4 times higher
- Disposable income will be 5 times higher
- Depopulation will occur due to low birth rates
- Ageing populations

Developing cities (NEEs and LICs)

- Cities in Africa will expand
- Cities will experience rapid population growth eg. Luanda will increase by 60% from 2017-2030
- Jakarta will overtake Tokyo as the biggest megacity

Sustainability of urban greening

- Reduce CO2 levels by storing it in trees → slow the rate of global warming
- Trees soak up rainwater → less chance of flooding
- Trees reduce noise pollution → improve people's quality of life
- Trees create animal habitats → increase urban biodiversity
- Trees provide shade → less need for air conditioning
- Trees provide food → reduce food miles and provide an income
- Trees reduce the heat island effect → less demand for energy to power expensive and environmentally damaging air conditioning

Urban change in the UK

Opportunities

- Creation of housing (UK have a shortage of homes)
- New businesses and shops
- Job creation
- Energy efficient homes

Challenges

- Loss of green open space
- Competition for local independent businesses
- Factories relocated overseas- job losses in manufacturing industries
- Building of flood plains increases the risk of flooding



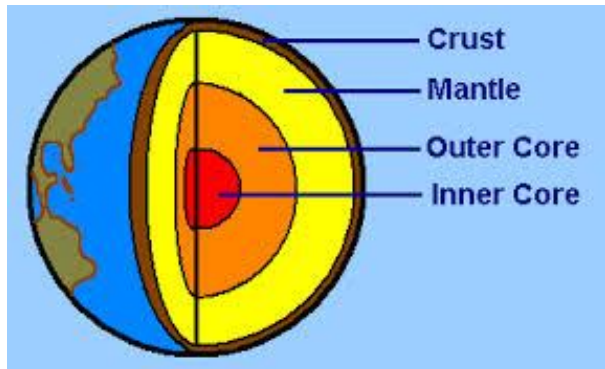
Counter urbanisation in the UK

<p>Push factors (negative urban)</p> <ul style="list-style-type: none"> • Poor quality housing • Low environmental quality • Noise and air pollution • High levels of crime 	<p>Pull factors (positive rural)</p> <ul style="list-style-type: none"> • Clean and quiet • More space • Bigger gardens • Less crime • Increased car ownership so commuting to cities for work is possible • Fast internet so working from home is possible
<p>Rural impacts</p> <ul style="list-style-type: none"> - Country villages grow and lose their character - House prices increase, pricing out local people - Traffic congestion increases - People buy second homes and they stand empty for a large amount of time 	<p>Urban impacts</p> <ul style="list-style-type: none"> - Derelict building - Increased rates of crime - House prices drop because people don't want to live there

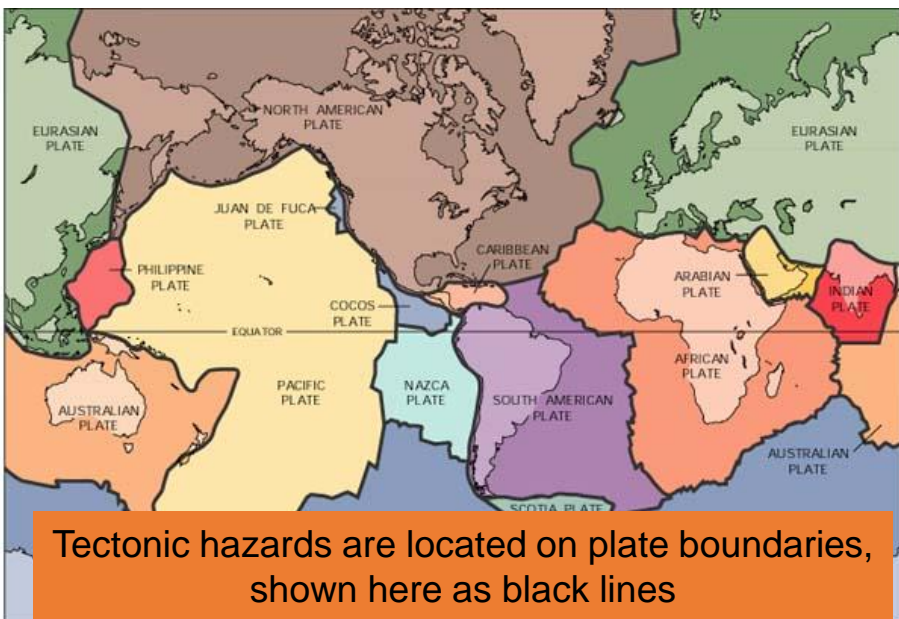
YR8 Shaky World Knowledge Map

Structure of the Earth:

CRUST- Rock between 5-90km thick broken up into tectonic plates
MANTLE- Semi molten rock that is moving slowly due to convection currents
OUTER CORE- Liquid layer of iron and nickel
INNER CORE- Solid layer of iron and nickel



Key word	Definition
Tectonic hazards	Hazards caused by the movement of tectonic plates
Convection currents	Currents in the mantle which cause plates to move
Oceanic crust	Crust that has ocean on top of it
Continental crust	Crust that has land on top of it
Eurasian Plate	The tectonic plate that we live on
Pacific plate	The largest tectonic plate in the world
Plate boundary	Where two plates meet
Seismic waves	The waves that cause the ground to shake in an earthquake
Epicentre	The central point on the earthquake on ground level
Focus	The point underground where the energy of the earthquake is release
Subduction zone	The point where the oceanic plate dives under the continental plate on a destructive boundary
Primary impacts	The immediate and direct impacts of a tectonic hazard 4.
Secondary impacts	The indirect and long term impacts of a tectonic hazard
Richter scale	Scale between 1-10 to measure earthquake size 5.
Prediction	Estimated when and where is at risk
Preparation	Planning and getting ready for a tectonic hazard
Protection	Preventing damage from tectonic hazards

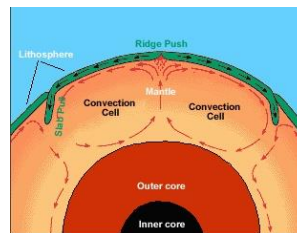


Tectonic hazards are located on plate boundaries, shown here as black lines

Plate boundaries

Convection currents

At the core, temperatures are very hot (up to 5,000 degrees C!). This heat causes the hot rock in the mantle to rise. As the rock moves away from the source of heat, it cools. This causes the rock to sink. This continued rising and sinking causes tectonic plates to move in all directions creating tectonic hazards. Think about a lava lamp.



Conservative eg. Haiti

- Two plates slide past each other (in the same or different directions) due to convection currents
- Plates get stuck and pressure builds
- Eventually this energy is released as seismic waves from the focus
- The seismic waves push outwards and reach the epicentre causing the ground to shake

Constructive eg. Iceland

- Plates move apart due to convection currents
- Space created for magma to escape through, which created new land (normally under oceans)
- As magma cools and solidifies, pressure builds as new magma tries to rise and escape
- This pressure eventually gets too much and is released as a volcanic eruption

Collision eg. Nepal and the Himalayas

- Two continental plates move towards each other due to convection currents
- As they're of similar densities, the plates move upwards to form fold mountains
- When the plates get stuck, pressure can increase
- Eventually this energy is released as seismic waves from the focus
- The seismic waves push outwards and reach the epicentre causing the ground to shake

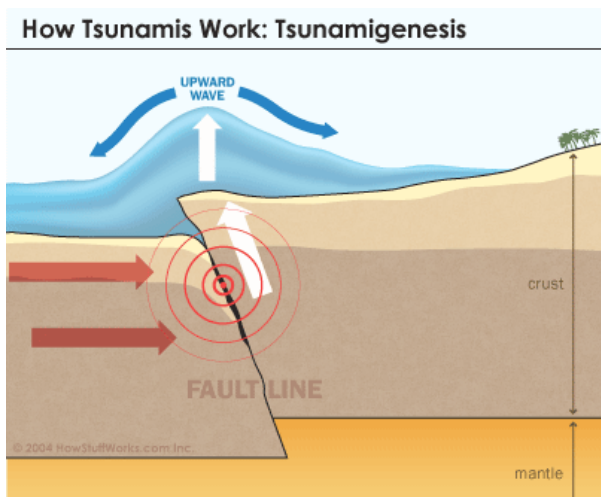
Destructive eg. Japan

- Oceanic and continental plate move towards each other
- The oceanic plate is more dense and subducts under the continental plate
- As this happens the plates can get stuck and pressure can build and release to form earthquakes
- As the oceanic plate enters the mantle it melts to form magma
- Magma rises to escape but can get stuck which causes pressure to build and result in a volcanic eruption

Example	Primary impacts	Secondary impacts	Management & response
Haiti earthquake 2010 (LIC) 8.	250,000 dead 70% of buildings in Port au Prince destroyed	1 million homeless Waterborne diseases 5,000 orphans	Lack of knowledge Last EQ 200 years ago Poor building design led to the pancake effect
Japan Tsunami 2011 (HIC)	16,000 deaths due to the tsunami 190,000 buildings damaged	24-25 million tonnes of debris Fukushima- nuclear power plant explosion 325,000 homeless Cost US\$300bn	Early warning system in place Earthquake resistant buildings caused minimal destruction from the earthquake itself. Quick response emergency services
Boxing day tsunami 2004 (LIC)	Total deaths approx. 250,000 across 11 9. countries Indonesia death toll 165,945	500,000 homeless in Indonesia alone Cost US\$9.9bn	No early warning systems Poor organisation and sanitation in hospitals Lack of search and rescue equipment

Tsunami formation

They occur at a destructive plate boundary. Where the oceanic plate subducts under the continental plate, the oceanic plate can get caught. Over time this pressure will build and eventually the oceanic plate will flip upwards, displacing all the water above it as a wave.



Reducing the impacts of tectonic hazards:

Preparation & planning

- Earthquake drills
- Train emergency services

Protection & prevention

- Earthquake proof buildings
- Retrofit old buildings to make them stronger
- Strict building regulations

Prediction

- Seismic gap theory
- Monitoring animal behaviour
- Hazard mapping
- Tsunami warnings

Yellowstone national park

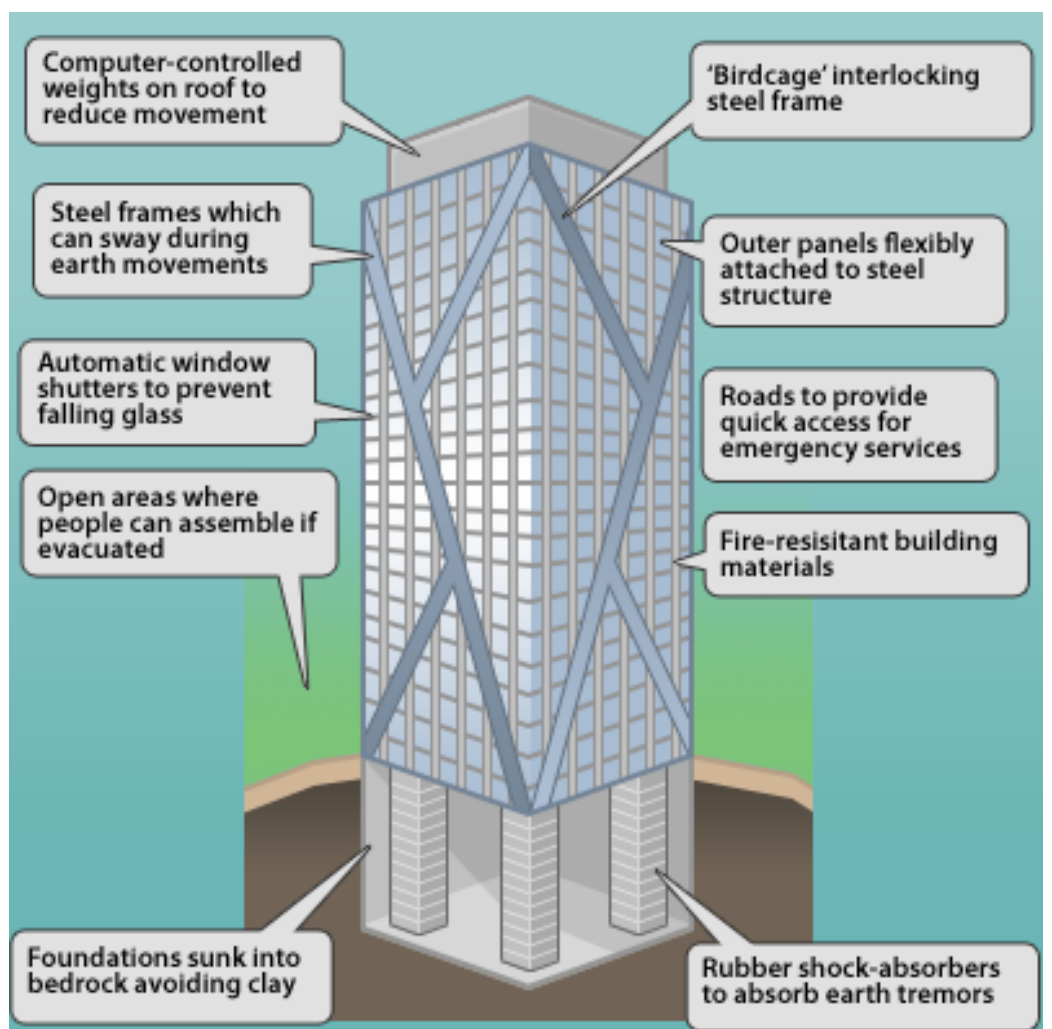
Location: USA, Wyoming (NW)
Super volcano- an eruption that would be significantly larger than all other eruptions
Last erupted: 640,000 years ago
Many believe another eruption is long overdue

Local impacts:

90% of people killed within 1,000km radius
¾ of USA affected
Transport networks destroyed
Contaminated water supplies

Global impacts:

Annual temperature decrease of 10 degrees
Global temperatures could drop for 6-10 years
Global weather patterns change eg. Monsoon rain could fail



	LIC	HIC
Factors affecting impacts:	Mount Sinabung, Indonesia 2014	Eyjafjallajökull, Iceland 2010
Level of development	55% work as farmers GNI per capita \$3,840	5% work as farmers GNI per capita \$67,960
Population	High population density 17,500 evacuated	Low population density 800 people evacuated
Monitoring	Not closely monitored making prediction less reliable	Close monitoring of all volcanoes in Iceland
Impacts of eruption	15 deaths 28,000 homeless Loss of farm land	0 deaths 0 homeless Flights across the world grounded (airlines lost \$30 million per day)



Advantages of living close to a volcano

Farming: <ul style="list-style-type: none"> Ash provides nutrients to the soil Rich soil for good quality crops Farmers earn a good living Eg. Olive farming in Italy 	Geothermal energy: <ul style="list-style-type: none"> Renewable energy Cheap energy No fossil fuels burnt= less CO2 Eg. Iceland
Tourism: <ul style="list-style-type: none"> Tourists visit and spend money Tourists support other local businesses eg. Souvenir shops, restaurants and hotels Jobs provide tax to the government Eg. Vesuvius, Italy 	Natural resources: <ul style="list-style-type: none"> Diamonds Bassalt (road construction) Sulphur dioxide used in food processing Resources worth money Taxes produced

Haiti Earthquakes comparison: Factors effecting the impacts of earthquakes in an LIC

	2010	2021
Magnitude	7.0	7.2
Location	15 miles west of Haiti's capital Port-au-Prince.	93 miles west of Haiti's capital
Death toll	250,000	2,248
Injuries	4,000	12,000
Cost of damage	\$8 billion	???



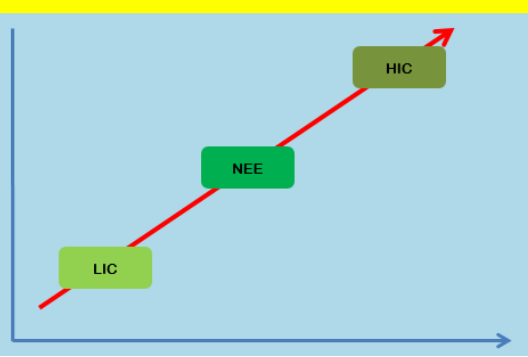
Standard of living is the wealth and material comfort available to a person or country and is **objective**, which means it is based on **factual evidence**.



Quality of life is standard of health, comfort and happiness and is **subjective**, which means it is influenced by **people's opinions**.

Year 8: The development gap

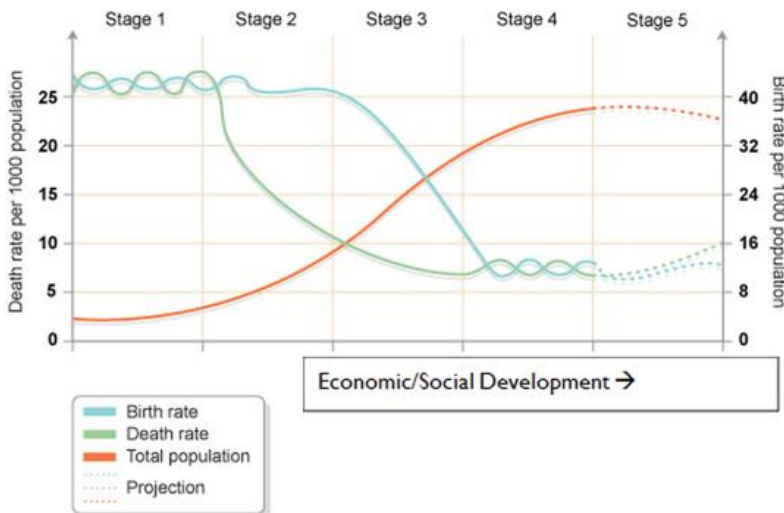
Countries change over time...



Key term	Definition
Development	Economic growth, change and improvements to quality of life
LIC	Low income country
NEE	Newly emerging economy
HIC	High income country
Development indicators	Ways to measure development using numbers
Aid	Help given by one country to another in the form of money or resources (food, doctors)
Short term aid	Money or resources given to a country to help in an emergency
Long term aid	Money or resources given to a country to help development
TNC	Transnational company
Corruption	Dishonest or fraudulent conduct by those in power (eg government)

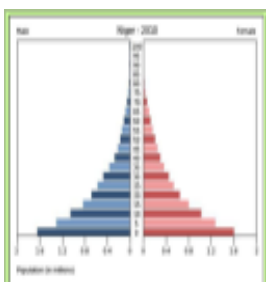
Development indicator	Meaning	Increase or decrease with development
GDP	Gross domestic product- total value of services and goods within a country	Increase
Life expectancy	Average number of years you're expected to live for	Increase
Safe water	% of the population with access to safe water	Increase
Male / female illiteracy	% of male / female population that cannot read and write	Decrease
Healthcare	Number of doctors per 10,000 or 100,000 of the population	Increase
Infant mortality	Number of babies that die before their 1 st birthday out of 1000 born	Decrease
Birth rate	Number of births per 1000 of the population	Decrease
Death rate	Number of deaths per 1000 of the population	Decrease

The Demographic transition model (DTM)-

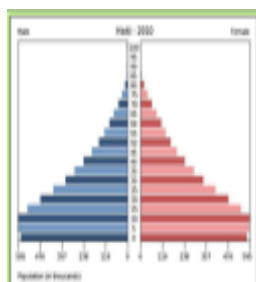


Stage	Birth rate	Death rate
1 (tribe)	High- lack of contraception & family planning, big families to help on farms	High- No healthcare or medicine
2 (LIC)		Lowering- improved access to healthcare, doctors, food and water
3 (NEE)	Lowering- family planning, contraception, more babies surviving	
4 (HIC)	Low- empowerment of women, women choosing careers over babies	Low- good diet and health care / medicine improvements
5 (Japan)	Below death rates- population decrease	Higher than birth rates- ageing population

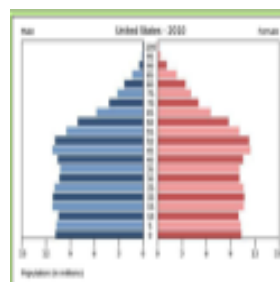
Population pyramids- structure of a countries male and female population at different age groups



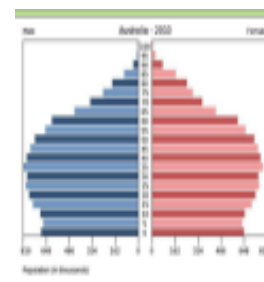
Stage 1



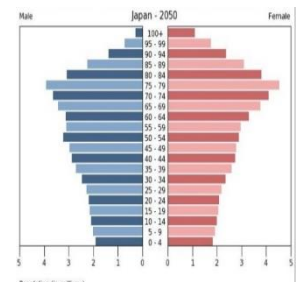
Stage 2



Stage 3



Stage 4

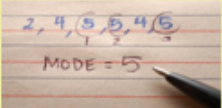
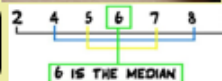




Stage 5

Factors limiting development

<ul style="list-style-type: none"> • Environmental 1. A poor climate 2. Poor farm land 3. Limited water supplies 4. Lots of natural hazards 5. Few raw materials 	<ul style="list-style-type: none"> • Economic 1. Poor trade links 2. Lots of debt 3. Economy based on primary products
<ul style="list-style-type: none"> • Political 1. Unstable government 2. Corrupt government 3. War 	<ul style="list-style-type: none"> • Social 1. Lack of clean water 2. Low level of education 3. Low social status of women

MAC in Geography: knowledge

- **What is the mode?** **MOST common** 
- **What is the median?** **Middle value (when in order of size)** 
- **What is the mean?** **AVERAGE: total of item ÷ NUMBER of items** 
- **What is the range?** **DIFFERENCE between the highest and lowest** 

Strategies to encourage development (evaluation)

Strategy	Advantages	Disadvantages
Short term aid	Help countries in an emergency with supplies that will save people's lives	Corruption / not getting through to those in need Does not help countries to be independent
Long term aid eg. Goat aid	Help countries to develop independently 5 Ms (milk, manure, mating, money, meat) Farm Africa educate the local communities	Goats encourage desertification (fertile land turns to desert) Another being to look after (feed, medical bills)
Trade	Jobs and income Encourages relationships between countries	Corruption & theft HICs taking advantage of LICs (cheap labour, land)
Fairtrade	Farmers receive a good price for their produce More money to spend on their family and education Break free from the poverty cycle	Not all products that claim to be Fairtrade are 100% Price of products is more expensive for the customers
Tourism eg. Kenya	Jobs for local people Taxes earned with less people unemployed Income made from selling goods to tourists Supports the multiplier effect (see below)	Package holidays mean that only a small proportion of the money goes to the country they're visiting Poor pay and conditions for workers Local people are exploited Locals cut off from important facilities such as water
TNCs	Jobs for local people Better paid jobs than traditional primary jobs Taxes earned for the government to spend on services and facilities Multiplier effect	Taking advantage of local people (exploitation) Poor wages and conditions for locals Damage to the environment as less environmental laws

The multiplier effect:

Wolfsburg, Germany → Originally a town with a population of 1000 people in 1938 → VW factory building VW Beetles built → Jobs provided for locals → More people move to the area → construction jobs → services needed for growing local population (peaked in 1973 to 131,971) → more jobs in schools and other services and shops → more people move to the area....



Examples of TNCs

British American Tobacco, Indonesia

Advantages:

- + Directly employs 6 million people in Indonesia
- + 20 million people rely on the Tabaco industry for jobs there

Disadvantages:

- 1/3 of Indonesians smoke (even some under the age of 5)
- No advertising laws in Indonesia mean forceful and aggressive advertising is used
- Smoking causes 200,000 deaths per year in Indonesia
- In Indonesia, children are employed to work in tobacco factories without safety regulations
- There is deforestation of rainforests to make room for the tobacco plantations
- Tobacco plants consume more nutrients than other crops
- A cigarette machine uses up to 4 miles of paper and hour



BRITISH AMERICAN TOBACCO



Examples of TNCs

Coca Cola



© Coca-Cola Ltd.

PYCOMALL.COM

Advantages:

- + Makes \$35.1 billion per year
- + 10, 450 coca cola soft drinks are drunk every minute
- + Employs lots of people globally
- + People enjoy the drink in every country except Cuba and North Korea
- + River Nar ecosystem restoration project in the UK sponsored by Coca Cola
- + Women employed in the distribution centres in Tanzania
- + Sustainable packaging in USA

Disadvantages:

India:

- Using up locals water supplies.
- 2.5l of water to every 1l of Coca Cola
- Pesticides used in drink

Columbia:

- Trade union workers killed for campaigning for better pay and working conditions
- Black Eagle terrorist group employed by Coca Cola to kill trade union workers

El Salvador

- Water pollution
- 30,000 children employed in the sugar cane fields which supply factories making Coca Cola



YEAR 8: Rivers



Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

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



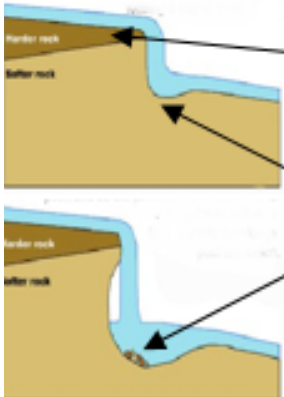
Areas -200m: Flat or rolling hills. Warmer weather. i.e. Fens

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

Upper Course of a River

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

Formation of a Waterfall



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

Transportation

Solution - Minerals dissolve in water and are carried along.

Suspension - Sediment is carried along in the flow of the water.

Saltation - Pebbles that bounce along the sea bed.

Traction - Boulders that roll along a river/sea bed by the force of the flowing water.

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

Attrition - Rocks that bash together to become smooth/smaller.

Solution - A chemical reaction that dissolves rocks.

Abrasion - Rocks hurled at the base of a cliff to break pieces apart.

Hydraulic Power - Water enters cracks in the cliff, air compresses, causing the crack to expand.

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

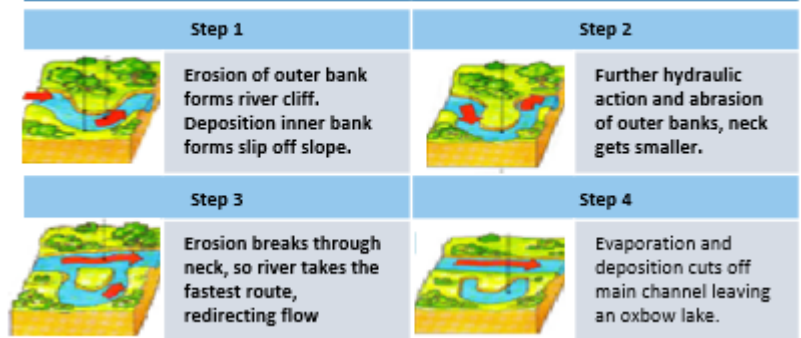
Infiltration - Water absorbed into the soil from the ground.

Transpiration - Water lost through leaves of plants.

Middle Course of a River

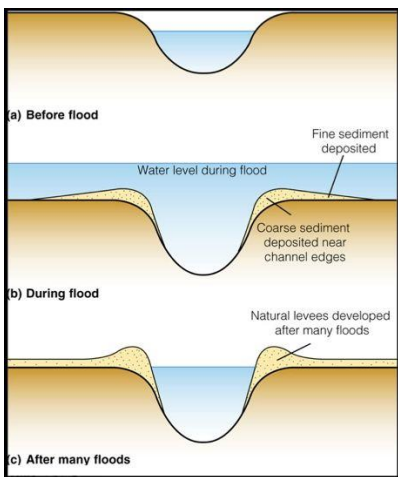
Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Formation of Ox-bow Lakes



Lower Course of the 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.

Physical and Human Causes of flooding.

Physical: Prolonged & heavy rainfall - Long periods of rain causes soil to become saturated leading runoff.

Physical: Geology - Impermeable rocks causes surface runoff to increase river discharge.

Physical: Relief - Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.

Human: Land Use - Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

Hydrographs and River Discharge

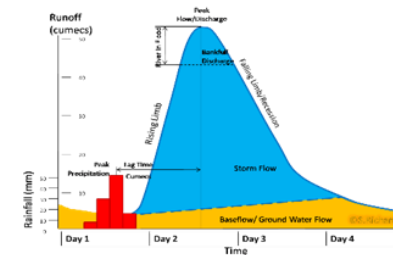
River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

Peak discharge is the discharge in a period of time.

lag time is the delay between peak rainfall and peak discharge.

Rising limb is the increase in river discharge.

falling limb is the decrease in river discharge to normal level.



River Management Schemes

Soft Engineering

Afforestation – plant trees to soak up rainwater, reduces flood risk.

Demountable Flood Barriers put in place when warning raised.

Managed Flooding – naturally let areas flood, protect settlements.

Hard Engineering

Straightening Channel – increases velocity to remove flood water.

Artificial Levees – heightens river so flood water is contained.

Deepening or widening river to increase capacity for a flood.

Case Study: 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

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.



Management

-Towns such as Yarm and Middleborough are economically and socially important due to houses and jobs that are located there.

-Dams and reservoirs in the upper course, controls river's flow during high & low rainfall.

- Better flood warning systems, more flood zoning and river dredging reduces flooding.

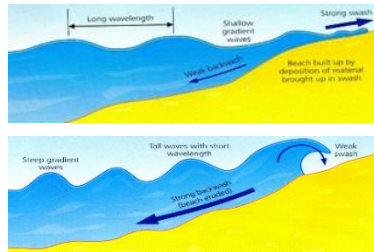
Year 8: Coasts

Waves

Formation - 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.

Size - Determined by the fetch which is how far the wave has travelled, the strength of the wind and how long the wind has been blowing for.

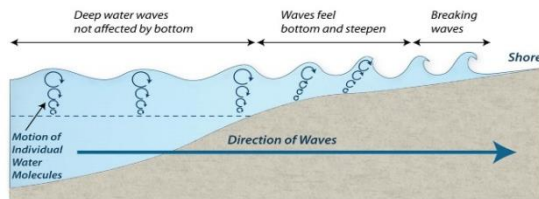
Constructive wave - This wave has a swash that is stronger than the backwash. This therefore builds up the coast.



Destructive wave - This wave has a backwash that is stronger than the swash. This therefore erodes the coast.

Why do waves break?

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



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

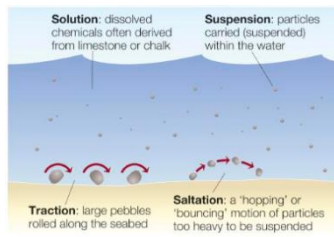
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Hydraulic Power - Water enters cracks in the cliff, air compresses, causing the crack to expand.



Weathering

Weathering is the breakdown of rocks where they are.

Carbonation - Breakdown of rock by changing its chemical composition.

Mechanical - Breakdown of rock without changing its chemical composition.

Mechanical Weathering Example: freeze-thaw weathering

Stage One
Water seeps into cracks and fractures in the rock.



Stage Two
When the water freezes, it expands about 9%. This wedges apart the rock.



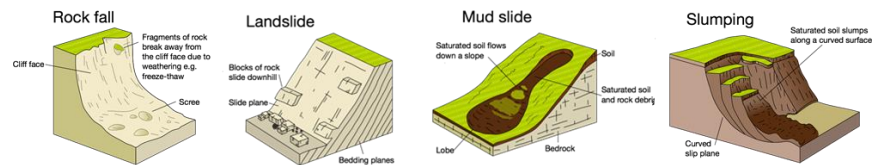
Stage Three
With repeated freeze-thaw cycles, the rock breaks off.



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.



Transportation

Solution - Minerals dissolve in water and are carried along.

Suspension - Sediment is carried along in the flow of the water.

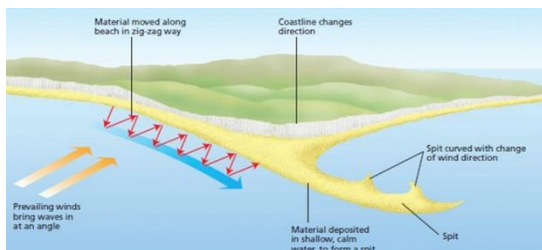
Saltation - Pebbles that bounce along the sea bed.

Traction - Boulders that roll along a river/sea bed by the force of the flowing water.

Formation of Coastal Spits

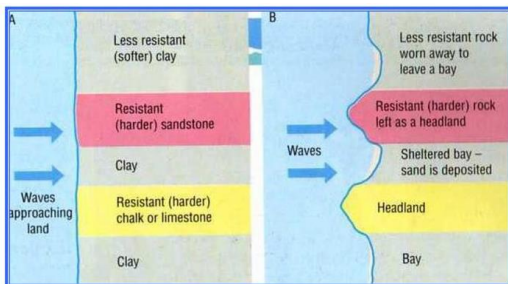
A spit is a long, narrow finger of sand or shingle jutting out into the sea from the land.

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



Bays and Headlands

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



Coastal Defences

Hard Engineering Defences

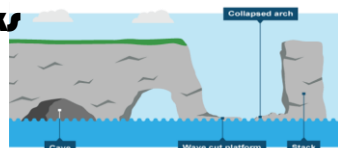
Groynes	Wood barriers prevent longshore drift, so the beach can build up.	<ul style="list-style-type: none"> ✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: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

Soft Engineering Defences

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



Caves, arches and stacks



Example:
Old Harry
Rocks,
Dorset

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

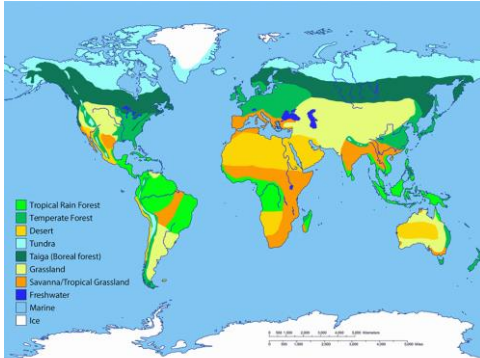
Year 7: Endangered Ecosystems

Maths in Geography

Bar graph to display data

Year	Number of cattle in Brazil (Million)
1980	22
1990	31
2000	38
2010	49
2020	52

Location of world biomes



Characteristics of main biomes:

Grasslands: Within the tropics. Hot with a wet and dry season. Mainly grass and a few specially adapted trees.

Desert: 15-30° north and south of the equator. Very hot and dry. Limited plants.

Taiga: Found between 50° and 60° north of the equator. Coniferous evergreen trees.

Savanna: Found to the north and south of tropical rainforest biomes. A wet season and a dry season. Scrub, grasses and occasional trees.

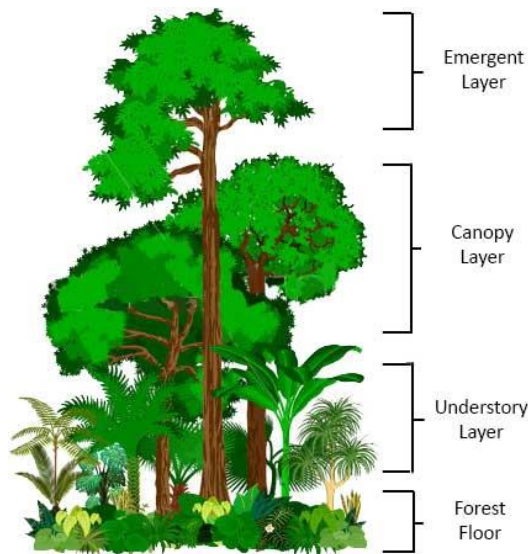
Tropical rainforest: 23.5° north - 23.5° south of the equator. Hot and wet all year. Rich in plants and animals. Poor soils.

Temperate forest: 60° north of the equator and on mountains. Long, cold winters. Short, mild summer. Limited rainfall. Coniferous trees.

Tundra: The ground stays frozen for most of the year and little precipitation & vegetation. Summers long days, winter long and dark.

Key term	Definition
Endangered	At risk from damage or total destruction.
Ecosystem	A community of animals, plants and microorganisms, together with the habitat where they live.
Biome	A large scale ecosystem.
Climate	Average weather conditions over longer periods and over large areas.
Biodiversity	The range of animals and plants in a given area.
Equator	The line around the centre of Earth, parallel to the Tropics of Cancer and Capricorn.
Deforestation	The process whereby natural forests are cleared through logging and burning.
Sustainable	The practice of using natural resources responsibly today, so they are available for future generations tomorrow.
Photosynthesis	A chemical reaction that takes place inside a plant's leaves, producing food for the plant to survive.
Adaptation	
Desertification	
Resource	
Climate Change	A change in global or regional climate patterns, due to rising temperatures in the earth's atmosphere
Ecotourism	Tourism directed towards exotic, often threatened, natural environments, intended to support conservation efforts.

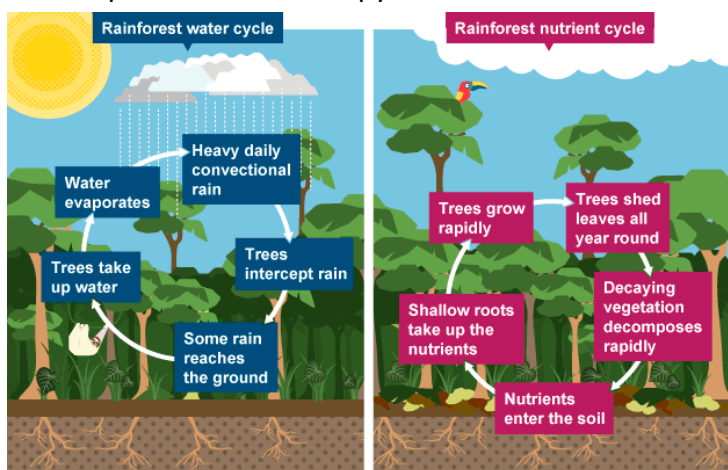
Rainforest layers



Causes of deforestation

- **Cattle farming – 80% land clearance increase population = increase demand for cows** → beef, medicines, cosmetics
- **Palm oil- oil in nearly every product available** → P&G products- big problem in Indonesia/Malaysia – future for Brazil?
- **Gold mining- extracting raw material from soil with high pressure hoses and chemicals** → Amazon Basin rich in mineral- ops – better pay challenges- working conditions, water sources polluted, open cast pits

Rainforest cycles effect the quality of soil because of their speed. High amount of plants/animals = decomposition happens quickly- nutrients sit on top soil. Convectional rainfall formed from evaporation from canopy level trees.



Plant adaptations

- **Drip tip leaves** – Rain runoff quick avoid fungus & bacteria avoid rot.
- **Epiphytes** – on branches of trees, nutrients from air, water, dead material & easier access to sunlight.
- **Pitcher Plant-** Nectar to attract insects/small rodents, fall into pitcher, digested for nutrients.
- **(ANIMAL) Spider Monkey-** Large to scare others, powerful tail for climbing, swing from branches to avoid predators.

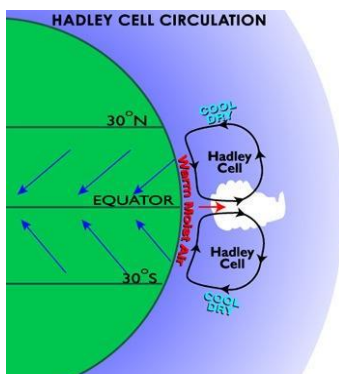
Animal adaptations

- **Sloth** – Slow, green algae camouflage- predator avoidance, strong arms to climb
- **Poisonous Dart frog** – Bright colours to warn against toxins in skin chemical defence, lay eggs on leaves and piggy back tadpoles to water.
- **Toucan-** large beak to collect fruits eggs etc. adjusts blood flow to beak to control heat, backwards toes to hold branches

Hot Deserts

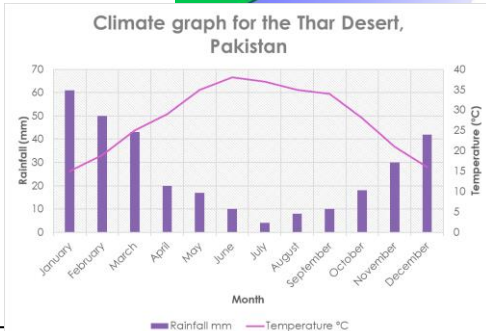
Location-why?

Air around the Tropics of Capricorn and Cancer is dry- zone of high air pressure where the air sinks. Air at the equator rises and cools - condensation then forms rain. The air then moves north and south until it gets to about 30° north and south of the equator- sinks. This air is dry and no condensation can form, so there is no rain.



Climate (graph)

Low precipitation – changeable Throughout year. Temperatures As high as 38 degrees in June.



Desertification

Causes: Climate change, population growth, overgrazing, deforestation

Risk of desertification- world map- Southern- Spain, Portugal Italy, Bulgaria, Greece, Romania

Main cause in Europe- Climate change (Temperatures are projected to increase 2°C and precipitation is projected to decrease by 50 % or more in southern Europe), strong relationship between CO2 and temperatures both increasing.

Impacts of desertification- Droughts, Low crop production- food insecurity, Farming businesses loose money, Crop pest attacks, Trees dying, Loss of biodiversity, Flooding, Migration of farmers, Sandstorms.

Reducing impacts – Planting more trees, stop overgrazing, less chemical fertilisers, sustainable farming, water management (earth dams).

Oceans - GPGP

Oceans as a resource – fishing, tourism, 70% of Oxygen on earth, renewable energy.

Oceans misuse- Pollution, biodiversity reduced, animals harmed, raw sewage

Key facts:

1. The GPGP is the twice the size of Texas
2. It weighs more than 87,000 Tonnes
3. The garbage patch is located in the Eastern Pacific Ocean.
4. It is one of 6 garbage concentrations around the world.
5. Gyres are rotating ocean currents which are formed by wind patterns and rotation of the earth. True
6. Most plastic floats once it encounters the sea because it is less dense than water.
7. Lighters, pens, toothbrushes, bottles, fishing nets, plastic bags, cell phones etc.
8. Fishing nets can entangle marine life/coral reefs, marine life can eat microplastics.
9. Moving its way up the food chain- until humans eat these fish etc.

Causes- Rubbish not managed well (80% from America and Asia land, 20% shipping vessels) Gyres- rotating ocean currents.

Impacts- Marine life eating plastics/become entangled, blocking sunlight for algae, microplastics in food chain, commercial fisheries, Hawaii 10 ft trash, swimmers/tourists.

Solutions to ocean plastic- Use, production, recycling, other materials (biodegradable) ocean clean ups

Coral reefs

A coral reef is a line of coral **polyps** found in warm shallow seas, they are tiny carnivorous (meat eating) animals. Each polyp builds a case of limestone around itself, using calcium from the water.

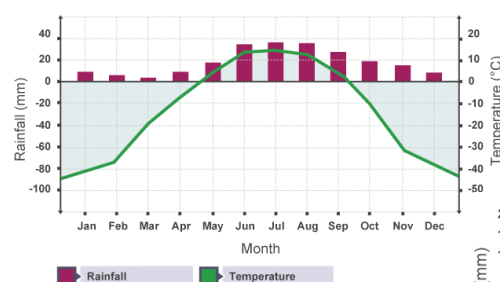
Location: Coral reefs are located in tropical oceans near the equator, between the Tropics- Pacific ocean, Caribbean sea, Red sea, Indian ocean.

Importance: Economic importance (Yearly earnings globally \$29, 8 billion), **Habitat** (1 million plant and animal species live there- 25% of ocean species, biodiversity hotspot, young fish), **Food** ("Well managed" reef can provide between 5 and 15 tons of food per square kilometre), **Tourism** (Over 100 countries benefit from coral reef related tourism), **Coastal protection** (absorb wave energy, slow down coastal erosion, reduce damage of tsunamis and hurricanes)

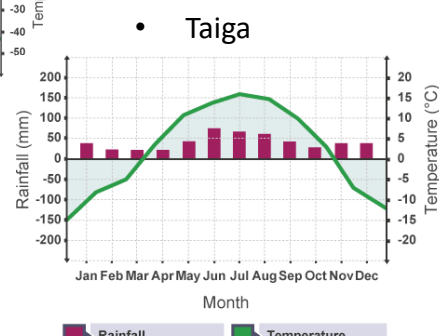
Needs- Tropical sea conditions (between the two tropics) Warm waters (over 18° centigrade all year round) Clear water (no sediment) No pollution Sunlight Water less than 60 metres deep

Threats to coral reefs- Recreation, Climate change, Overfishing (fishing practices- E.G. Fish bombing in Borneo), Pollution.

Threats to Tundra- melting of permafrost due to increasing global temperatures → Building stability, hospitals, schools, roads etc., 'drunken trees', loss of lakes, ponds for reindeer herders. Melting ice → polar bears habitat destroyed, methane releases from ice – rotting plants.



• Tundra



• Taiga

	Tundra	Taiga
Location	Arctic tundra located far north in northern hemisphere.	Found between 50° and 60° north of the equator.
Climate	Summers long days short period (average 12 degrees), winter (-34° C) very long and dark.	Average precipitation 12-30 inches a year. Temperatures range from 10 degrees and -3 degrees.
Landscape	The ground stays frozen for most of the year (permafrost) and little precipitation & vegetation- barren.	Short growing season 3 months. Evergreen pine needle trees- not large biodiversity of plants.
Plants & Animals	Arctic fox, Polar bear, reindeer & low lying grasses, shrubs, herbs, and lichens.	Otter, Lynx, grozgly bear. Coniferous evergreen trees.

Tourism in Antarctica

Reasons to visit → Wildlife, History, Adventure, Unique landscapes, Activities

How many visitors graph → Peaked 45,000 07-08 – now up to 30,000 2012-13

Stakeholders → Countries who own parts of Antarctica, Polar cruises, International Association Antarctica Tour Operators, Greenpeace

Positives (advantages) of tourism →

Increased appreciation- conservation

Help scientists collect data on wildlife

No evidence that tourism has disturbed breeding patterns

Code and conduct in place to protect wildlife

Negatives (disadvantages) of tourism →

Services change the natural environment

Vehicles on ice change shape/damage

Large cruise ships struck iceberg – oil spills/discharge of sewage into sea

Animals stress through crowds- abandon eggs

How to create sustainable tourism in Antarctica → Limiting tourist numbers, limiting ship sizes, code of conduct for visitors, time with no visitors to certain areas, ocean clean ups.

Ecotourism- tourism directed towards exotic, often threatened, natural environments, intended to support conservation efforts and observe wildlife.

Specifically, ecotourism possesses the following characteristics:

Conscientious, low-impact visitor behaviour

Sensitivity towards, and appreciation of, local cultures and biodiversity

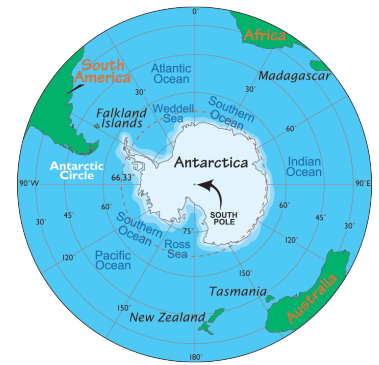
Support for local conservation efforts

Sustainable benefits to local communities

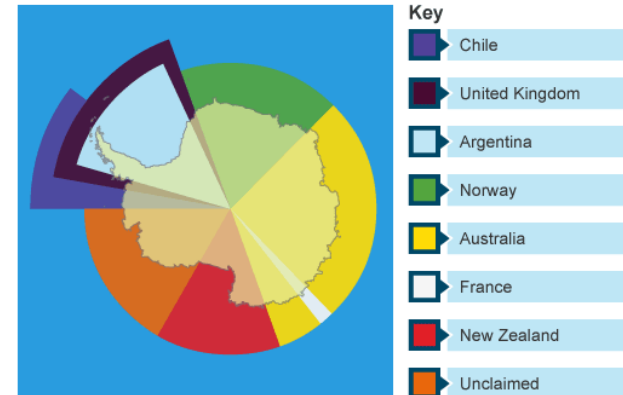
Local participation in decision-making

Educational components for both the traveller and local communities

Location



Stakeholders



Protecting our Endangered Ecosystems- “Dear Future Generations, Sorry”

4 methods to save our planet –

1. AN ENERGY REVOLUTION- phasing out fossil fuels and replacing with renewables
2. A FOOD REVOLUTION- Efficient food production and reducing our consumption of meat
3. MANAGE THE OCEAN- Global network of no fish zones and treaty of use of international waters
4. REWILD THE WORLD- Encouraging nature wherever we can

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

Where is Urbanisation happening?

Urbanisation is happening all over the world but in LICs and NEEs rates are much faster than HICs. This is mostly because of the rapid economic growth they are experiencing.

Causes of Urbanisation

1 - Rural - urban migration

Push factors

- Natural disasters
- War and Conflict
- Mechanisation
- Drought
- Lack of employment



Pull factors

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

2 - Natural Increase

When the birth rate exceeds the death rate.

increase in birth rate (BR)

- High percentage of population are child-bearing age which leads to high fertility rate.
- Lack of contraception or education about family planning.

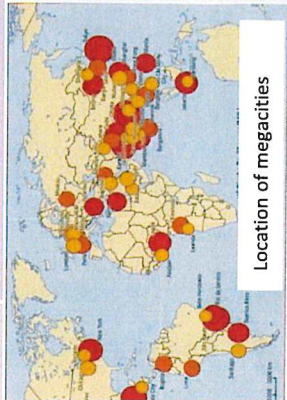
Lower death rate (DR)

- Higher life expectancy due to better living conditions and diet.
- Improved medical facilities helps lower infant mortality rate.

Types of Cities

legacity

An urban area with over 10 million people living there.



More than two thirds of current megacities are located in either NEEs (Brazil) and LICs (Nigeria). The amount of megacities are predicted to increase from 28 to 41 by 2030.

Location of megacities

Sustainable urban living means being able to live in cities in ways that do not pollute the environment and using resources in ways that ensure future generations also can use them.

Water Conservation

This is about reducing the amount of water used.

- Collecting rainwater for gardens and flushing toilets.
- Installing water meters and toilets that flush less water.
- Educating people on using less water.

Energy Conservation

Using less fossil fuels can reduce the rate of climate change.

- Promoting renewable energy sources.
- Making homes more energy efficient.
- Encouraging people to use energy.

Creating Green Space

Creating green spaces in urban areas can improve places for people who want to live there.

- Provide natural cooler areas for people to relax in.
- Encourages people to exercise.
- Reduces the risk of flooding from surface runoff.

Waste Recycling

More recycling means fewer resources are used. Less waste reduces the amount that eventually goes to landfill.

- Collection of household waste.
- More local recycling facilities.
- Greater awareness of the benefits in recycling.

Sustainable Urban Living Example: Freiburg

Background & Location

Freiburg is in west Germany. The city has a population of about 220,000. In 1970 it set the goal of focusing on social, economic and environmental sustainability.

Sustainable Strategies

- The city's waste water allows for rainwater to be retained.
- The use of sustainable energy such as solar and wind 40% of the city is forested



Integrated Transport System

This is the linking of different forms of public and private transport within a city and the surrounding area.

Brownfield Site

Brownfield sites is an area of land or premises that has been previously used, but has subsequently become vacant, derelict or contaminated.



Urban areas are busy places with many people travelling by different modes of transport. This has caused urban areas to experience different traffic congestion that can lead to various problems.

Environmental problems

- Traffic increases air pollution which releases greenhouse gases that is leading to climate change.



Economic problems

- Congestion can make people late for work and business deliveries take longer. This can cause companies to lose money.

Social Problems

- There is a greater risk of accidents and congestion is a cause of frustration. Traffic can also lead to health issues for pedestrians.

Congestion Solutions

- Widen roads to allow more traffic to flow easily.
- Build ring roads and bypasses to keep through traffic out of city centres.
- Introduce park and ride schemes to reduce car use.
- Encourage car-sharing schemes in work places.
- Have public transport, cycle lanes & cycle hire schemes.



Having congestion charges discourages drivers from entering the busy city centres.



Traffic Management Example: Bristol

In 2012 Bristol was the most congested city in the UK. Now the city aims to develop it's integrated transport system to encourage more people to use the public transport. The city has also invested in cycle routes and hiring schemes.



Urban Issues & Challenges

Greenbelt Area

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

Urban Regeneration

The investment in the revival of old, urban areas by either improving what is there or clearing it away and rebuilding.

<p>Location and Background</p> <p>Bristol is a city in the South West of England. The population of the city is 440 500 and is expected to increase to half a million by 2029.</p> 	<p>City's Importance</p> <ul style="list-style-type: none"> The city enjoys a large sporting heritage with famous athletes and football clubs as well as other culture and entertainment. Bristol has two major UK universities popular with young students. Tourism – UK's 8th most popular tourist destination. High level investment – BMW/Airbus M4. Easy access to London and Europe. 	<p>Location and Background</p> <p>Rio is a coastal city situated in the South East region of Brazil within the continent of South America. It is the second most populated city in the country (6.5 million) after Sao Paulo.</p> 	<p>City's Importance</p> <ul style="list-style-type: none"> Has the second largest GDP in Brazil. It is headquarters to many of Brazil's main companies, particularly with Oil and Gas. Sugar Loaf mountain is one of the seven wonders of the world. One of the most visited places in the Southern Hemisphere. Hosted the 2014 World Cup and 2016 Summer Olympics.
<p>Migration to Bristol</p> <p>During the industrial revolution, the population dramatically increased with people migrating from nearby rural communities.</p> <p>Large numbers from EU countries, in particular Poland and Spain due to retail, transport, construction and manufacturing.</p> <p>Migrants have had a huge impact on Bristol including: contributing to local and national economy, enriching the city's cultural life, improving skill level where there were shortages.</p>	<p>City's Opportunities</p> <p>Social: Bristol has various cultural attractions such as the Colston Hall & museums. Also Cabot Circus is very popular with shoppers.</p> <p>Economic: High tech industries have developed in Bristol. Broadband, university research and an educated workforce has helped this.</p> <p>Aardman animations is an example.</p> <p>Environmental: Bristol was European Green Capital in 2015. An ITS (Integrated Transport System) was put in place in 2012. There have been transport improvements, improved energy efficiency and the development of renewable energy.</p>	<p>Migration to Rio De Janeiro</p> <p>The city began when Portuguese settlers with slaves arrived in 1502. Since then, Rio has become home to various ethnic groups.</p> <p>However, more recently, millions of people have migrated from rural areas that have suffered from drought, lack of services and unemployment to Rio. People do this to search for a better quality of life.</p> <p>This expanding population has resulted in the rapid urbanisation of Rio de Janeiro.</p>	<p>City's Opportunities</p> <p>Social: Standards of living are gradually improving. The Rio Carnival is an important cultural event for traditional dancing and music.</p> <p>Economic: Rio has one of the highest incomes per person in the country. The city has various types of employment including oil, retail and manufacturing.</p> <p>Environmental: The hosting of the major sporting events encouraged more investment in sewage works and public transport systems.</p> <p>Self-help schemes – Rocinha, Bairro Project</p> <ul style="list-style-type: none"> The authorities have provided basic materials to improve peoples homes with safe electricity and sewage pipes. Government has demolished houses and created new estates. Community policing has been established, along with a tougher stance on gangs with military backed police. Greater investment in new road and rail network to reduce pollution and increase connections between rich and poor areas.
<p>City Challenges</p> <p>Social: High levels of social deprivation. Filwood = a third of people in the area and over half the children were in very low income families. Top 10% most deprived area in UK.</p> <p>Economic: Lack of investment has led to social inequalities in the city.</p> <p>Environmental: Urban sprawl has led to increased pressure and decline of greenfield sites around the city. Industrial buildings have become derelict.</p>	<p>Bristol City Centre Regeneration Projects</p> <p>Temple Quarter was very run down and it gave a bad impression to visitors as it was the first part of the city that they saw.</p> <p>Main features: Bristol's Temple Quarter covers 70 ha and is one of the largest urban regeneration projects in the UK. The 3 main aspects were:</p> <ul style="list-style-type: none"> Enterprise zone status: Encourages growth and creates jobs. New bridge across the Avon to connect the city. Improved access from in and around Bristol. 	<p>City Challenges</p> <p>Social: There is a severe shortage of housing, schools and healthcare centres available. Large scale social inequality, is creating tensions between the rich and poor.</p> <p>Economic: The rise of informal jobs with low pay and no tax contributions. There is high employment in shanty towns called Favelas</p> <p>Environmental: Shanty towns called Favelas are established around the city, typically on unfavourable land, such as hills.</p>	