Name: _____

Montsaye ACADEMY
Excellence Resilience Aspiration

Geography

Homework Booklet

Year 10

Term 6: Revision

- Use the knowledge organisers in this booklet to revise for your mock exam.
- You have also been emailed a link to Seneca Learning which has lots of revision activities.
- BBC Bitesize is also a useful revision tool.

Knowledge Organiser: Y9 Urban and rural processes in the UK

Overview of topic

What changes are taking place in where people live in both urban and rural areas of the UK?
What are the distinctive features of urban areas in the UK?
What factors help to drive urban and rural change across the UK?
What is the cause and effect of change in retail provision across the UK?
What are the issues associated with leisure use in urban and rural areas across the UK?
How is leisure use is managed, and how effectiveness is the management strategy at one UK location?

Keywords

Urbanisation - the growth of urban populations (growth of towns and cities)
Sub-urbanisation – the growth of residential areas on the edge of existing built-up areas further from CBD
Counter-urbanisation – the movement of some groups of people from urban to rural areas
Re-urbanisation – the movement of some groups of people and businesses into derelict / run down urban areas
Commuter settlement – places where people live but from which they travel each day to work elsewhere
Deprivation – characteristics that create a low quality of life (e.g. poverty / low income)
Sustainability – has minimal negative impact on the environment and on people and their futures
CBD – central business district (town or city centre) with shops, offices and leisure functions
Brownfield site – a site that has previously been built on and is disused / derelict
Green field site – a site that has not previously been built on (farmland)
Retail – shopping business
Honeypot site – a very popular visitor attraction or tourist site

Key concept #1 Distinctive features of urban areas?

Over time the processes of urbanisation, sub-urbanisation, counter-urbanisation and re-urbanisation have created distinctive spatial zones/patterns in UK towns and cities. These include **CBDs** (with pedestrianised zones and shopping centres e.g. **Highcross, Leicester**). Further out there are zones of affluence, zones of deprivation, zones undergoing rapid regeneration, zones where multi-cultural communities thrive and multi-purpose zones where people live, work and enjoy leisure and cultural opportunities. **See Cardiff Knowledge Organiser**. On the edge of urban areas there are golf courses, leisure complexes, country parks, ring roads, bypasses and out-of-town retail parks (e.g. **Fosse Park, Leicester**). Some urban areas (e.g. **London**) are surrounded by protected areas of countryside (greenbelts) where new building is restricted.

Question #2 Factors driving urban and rural change?

- The need to create **sustainable** communities (see Cardiff Knowledge Organiser – Passivhaus homes).
- The need to **build new homes** – estimated at an extra 240,000 each year to meet demand as a result of population growth, increase in one person households, internal migration and migration from the EU in economically growing areas such as SE England.
- The need to **redevelop disused / derelict urban areas** or **brownfield sites**– (see Cardiff Knowledge Organiser Cardiff Bay) to ensure economic and social health.
- The need to **build affordable housing in rural communities** and not just new **commuter settlements** on **greenfield sites**.
- The need to ensure that **commuting** and **teleworking** in rural areas doesn't further increase house prices beyond the affordability of local rural people.
- The need to **reverse depopulation in rural areas** due to unaffordability of housing, lack of well-paid jobs, poor access to and closure of services (such as shops, post offices, pubs, schools).
- The need to **create sustainable tran** pollution and carbon emissions (see Cardiff Knowledge Organiser – Cardiff Crossrail Project).

▲ **Figure 3** Egan's Wheel.

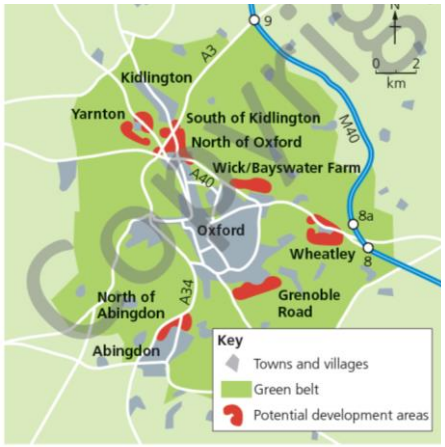
Key concept # 3 Cause and effect of change in retailing?

The decline of shopping areas within CBDs and the rise of out of town retail parks. The impact of range, threshold population and catchment area on shop types in each location. The advantages and disadvantages of each location for different groups of shoppers, and for the retail businesses. The social, economic and environmental impact of increased online shopping such as closure of physical stores (e.g. bookshops, electronic stores, clothing stores), growth of distribution centres in accessible rural areas near motorway junctions, and growth of courier businesses and jobs for deliveries.

Geographical Skills

- Describe locations on maps (using compass directions, scale line and surrounding features)
- Estimate areas on maps using grid squares and the scale line
- Describe patterns on choropleth maps (e.g. showing levels of deprivation and affluence)
- Interpret and extract information from bar graphs and line graphs
- Extract key data from tables and make inferences based upon the data
- Draw conclusions from numerical data
- Make reasoned choices and be able to justify those choices

Case study #1 Brownfield vs greenfield issues



▲ **Figure 5** Development areas suggested by Oxford City Council that are within Oxford's green belt.

Oxford City Council is planning for the building of up to 32,000 home to be built by 2031. Housing in Oxford is expensive and increasingly unaffordable (average house price in 2014 was £430,000; 15 times average salary). Many homes are planned on greenfield sites within Oxford's greenbelt, with rural communities opposing the plans.

Case study#2 Issues resulting from leisure use and management of leisure use

Stiperstones - rocky ridge in the Shropshire Hills AONB (Area of Outstanding Natural Beauty), within easy drive of the urban areas in the West Midlands. **Honeypot site** for walkers and cyclists. Soils are thin, **footpath erosion** is a problem due to trampling along the same routes. Number of visitors exceeds the **carrying capacity** (the ability of a landscape to absorb the impact of people without lasting damage). Honeypot sites are beautiful or interesting landscapes and accessible by road, within easy reach of large urban populations. Most are in AONB's or National Parks. These are managed to ensure that special and unique qualities of the landscape. Wildlife and cultural heritage are recognised and conserved. Work is done by small number of full time staff and by a large number of volunteers. Each area produces a 5 year management plan and identifies action points that need to be met. E.g. Stiperstones:

- Providing outdoor education opportunities for local schools
- Improving interpretation facilities and visitor information points
- Creation of more woodlands
- Promoting local food fairs and food events
- Develop training opportunities that support conservation land management
- Encourage more volunteering to help maintain the area (such as re-surfacing eroded footpaths), engage with visitors and help run events
- Encouraging visits by bike and public transport

Homework and enrichment opportunities

- Research greenfield and brownfield sites and developments in the Rothwell and Desborough area – create an annotated map showing where they are and what is happening at each site.
- Research and compare the shops, services and economic success of a CBD and an out-of-town retail centre (e.g. Sheffield city centre and Sheffield Meadowhall Centre).
- Research the social, environmental, economic impacts of a large sporting or leisure event on the local area (e.g. Glastonbury Festival https://geographycasestudy.com/case-study-glastonbury-festival/, or the 2019 cycling Tour de Yorkshire https://letour.yorkshire.com/tour-de-yorkshire-2019/).

8 marker example (WAGOLL) Major sporting events bring more benefits than costs?

The 2015 Rugby World Cup was played in 13 different venues in England and Wales. Around 16,000 new jobs were created directly in construction, ticket sales and venue staffing. Another 6,000 people gained experience as volunteers. Many other people gained indirect employment as taxi drivers, hotel cleaners and bar staff, and gained extra work as a result of the huge influx of visitors (466,000 international visitors). The sale of food generated £32 million; supporters in London spent £16 million and in Cardiff £7 million. The total estimated direct and indirect economic benefits are £2 billion across the 13 cities. £85 million was spent on improving infrastructure. Noise and parking issues created some negative impacts for locals in the host cities (within the sphere of influence of each stadium), but these declined rapidly with distance from the stadium and were short-term. Large events create a positive multiplier effect for local businesses.

Knowledge Organiser: Y9 Global cities - Cardiff

Overview of topic

Global cities are cities that play an important role in the global economic system of finance and trade.
Cardiff is 12th out of the 14 global cities in UK. Capital and largest city in Wales (479,000 pop). In South Wales, on the Bristol Channel coast. Accessible from London and UK motorway network by the M4. Main railway station and small international airport. Commercial centre, base for most national cultural institutions and Welsh media, seat of National Assembly for Wales. Significant tourist centre, most popular visitor destination in Wales.

Keywords

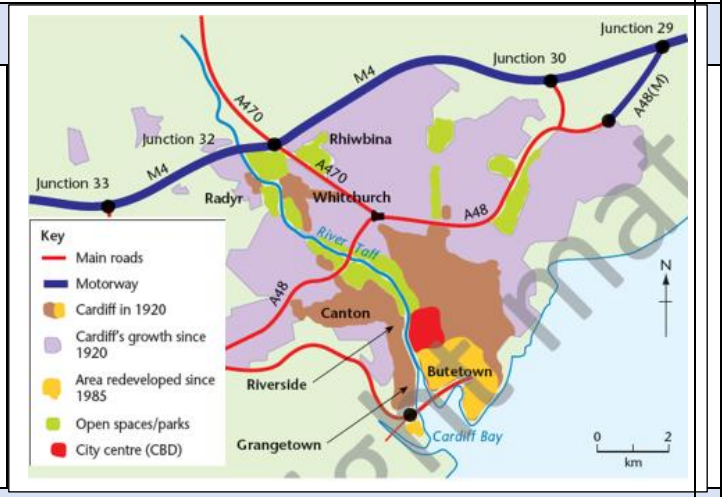
Urbanisation - the growth of urban populations (growth of towns and cities)
Rural to urban migration - the movement of people from countryside to towns and cities
Natural population increase – because birth rate is higher than death rate
Suburbanisation – the growth of suburbs on the edges of urban areas
Counter-urbanisation – the movement of people from cities to countryside areas
Re-urbanisation – the movement of businesses and people back into former derelict / declining parts of urban areas
Deprivation – characteristics that create a low quality of life (e.g. poverty / low income)
Sustainability – has minimal negative impact on the environment and on people and their futures
Urban regeneration – the improvement of derelict / run down urban areas

Key concept #1 Reasons for growth?

Grew from small market town to main coal and steel exporting port in UK in 19th century. Population increased rapidly due rural to urban migration, natural population increase (high birth rates) and international migration. Cardiff is 10% of the Welsh population, but the economy of Cardiff makes up nearly 20% of Welsh GDP and 40% of the city's workforce are daily in-commuters from the surrounding South Wales area. Cardiff is the principal Finance, Business Services, Public Administration, Education and Health sector centre in Wales.

Question #2 **Social, economic, cultural patterns?**

Grangetown: inner city, terraced houses built in the 1860's close to the docks. 30% of adults have no formal qualifications. Diverse district, significant population of Somali, Asian and mixed-race residents. Low income, high deprivation area.
Canton: inner city, mix of terraced housing styles, further away from the docks. 12% of adults have no formal qualifications, 60% have a university degree. Multi-cultural area - Asian population (India, Pakistan).
Rhiwbina: outer suburb, NW Cardiff near M4, built as a garden village (semi and detached houses with gardens and large areas of open space) in the 1920's. 22% of adults have no formal qualifications, 35% have a university degree. High income, low deprivation area.



Key concept # 3 Current challenges

Poverty - 32% of households (defined as a household income 60% or less than the UK average household income) high percentage of children living in workless and low-income households. Grangetown has lowest incomes and highest levels of deprivation in Cardiff (poor condition of housing, high crime rates, poor levels of health).
Housing - relatively unaffordable compared to other UK cities. The average house costs around eight times the average salary. High house prices can mean a decrease in living standards as a higher proportion of income is spent on housing costs.
Transport - traffic congestion, the cost and lack of availability of parking and poor public transport are seen as problems for city residents and commuters.

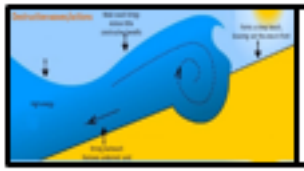
Geographical Skills

- Describe locations on maps (using compass directions, scale line and surrounding features)
- Estimate areas on maps using grid squares and the scale line
- Describe patterns on choropleth maps (e.g. showing levels of deprivation)
- Extract key data from tables and make inferences based upon the data
- Draw conclusions from numerical data
- Describe relationships on a scattergraph
- Give four and six figure grid references
- Interpret and extract information from bar graphs and line graphs

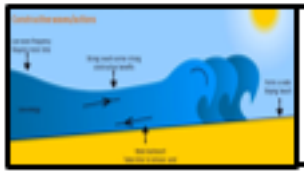
Case study #1 Affordable sustainable housing	Case study#2 Cardiff Bay regeneration	Case study#3 Improving transport
Council plans to build 1,500 sustainable, high-quality homes at 40 different sites. Zero carbon-emission Passivhaus homes. Use very little energy for heating and cooling through a mechanical ventilation system, high levels of insulation and windows with insulated frames. There are schools, playing fields, a supermarket, shops and other houses within 10 minutes of the first panned site. Of the properties included in this first site, 58 would be affordable homes – 40% of the total properties – including 33 apartments and 25 houses. There would also be a "central green space" as well as wetland area, new roads and new pedestrian links. The houses will be mainly two storey, but there will be some three-storey buildings. Each house will have two parking spaces, and each apartment one.	Regeneration of disused and derelict docks to create a mix of housing, open space, commerce, leisure and industrial development completed in 2000. Construction of a barrage across the mouth of the Bay created 200-hectare freshwater lake for leisure and recreation; new homes (Atlantic Wharf); new offices, National Assembly for Wales. Commercial and leisure facilities (Mermaid Quay) Atlantic Wharf Leisure Village. Achievements of project: 16,750 new jobs, 4,800 affordable housing units, 695,000 offices, leisure and retail units, 79 hectares of open space for leisure and recreation, 327 hectares of land reclamation, 42km of roads built or upgraded to improve accessibility and ease congestion.	Cardiff Crossrail scheme aims to reduce car journeys and improve air pollution. Integrates rail, bus and cycle transport across the city: Cardiff Cross Rail – light rail/tram line from east to west connecting major population centres and new suburbs in the west with Cardiff Central Train Station. Cardiff Circle Line – joined up complete orbital light rail/tram line linking large residential areas to the transport network. Rapid electric bus transport network. Safe cycleways and walking routes linked to bus, rail and tram networks. Park-and-ride at junction 32 of the M4 connected to the Circle Line. Integrated ticketing system allowing the user to move seamlessly from one transport mode to another. Making Cardiff a 20mph city.

Homework and enrichment opportunities	8 marker example (WAGOLL)
• **Exam question:** Explain why improving transport systems can help to make cities more sustainable. [6] • **Research:** Create a leaflet about the sustainability features of Passivhaus homes. https://www.youtube.com/watch?v=CasrjYhZB1M • **Research:** Create an information leaflet about the planned Cardiff Crossrail project. https://www.walesonline.co.uk/news/wales-news/cardiff-crossrail-map-transport-trams-16529975 • **Research:** Create a visitor leaflet showing how Cardiff Bay changed because of regeneration. https://www.bbc.co.uk/news/uk-wales-40681940	**Using your study of Cardiff, what conclusions can you reach about the social and economic issues facing urban areas of the UK?** Urban areas of the UK face a number of both social and economic issues including low incomes, high levels of poverty and deprivation, shortage and unaffordability of housing, traffic congestion and old industrial areas that have become derelict and are in need of regeneration. Cardiff has all of these issues to a lesser or greater extent. Cardiff is the capital of Wales and its economic centre, contributing 20% of Wales' GDP, through a range of service industries including finance, public administration, education and health. The average gross disposable household income in Cardiff is £18,137; compared to a UK average of £19,000. However almost 33% of people in Cardiff live in poverty (defined as having a household income 60% or less than the average UK household income), often in inner city areas like Grangetown. This means that these people are struggling to pay for their housing, food, fuel bills and transport costs. As a result, they may also be suffering from poor physical and mental health. To make matters worse housing in Cardiff is relatively unaffordable compared to other UK cities. The average house costs around eight times the average salary. High house prices can mean a decrease in living standards as a higher proportion of income is spent on housing costs. It can also have a detrimental impact on people's mental well-being and life choices, such as when they can afford to have children. Cardiff like most UK cities needs to build more affordable and sustainable housing. Urban regeneration projects like that in Cardiff Bay have improved the area and replaced the derelict docks with housing, leisure facilities and many service businesses. However many of the service industry jobs created are relatively low paid contributing to the lower than UK average household incomes in Cardiff. In a recent survey Cardiff residents said that traffic congestion, the cost and lack of availability of parking and poor public transport were their greatest concerns about living in the city. As well as affecting residents and businesses economically through increased travel costs and wasted journey times this also creates social issues such as air pollution and inconvenience.

Eduqas Geography: Theme 2: Coasts and Coastal Processes



Destructive waves: Strong winds, powerful waves and cause coastal erosion. They are tall and steep. The backwash is stronger than the swash, so material is carried out to sea.



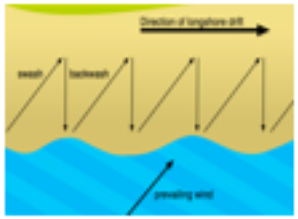
Constructive waves: Light winds, not powerful and cause deposition, rather than erosion. Stronger swash, so material is carried up the beach and deposited.

Four types of erosion

Attrition: Rocks bash into each other and become smoother and rounder.
Abrasion: Rocks that the wave is carrying are thrown against the coastline and wear it away over time.
Hydraulic action: Waves are forced into cracks in cliffs and compress the air back further. This widens the cracks.
Solution: Seawater is able to react with rock → dissolving certain rocks e.g. limestone.

Longshore drift

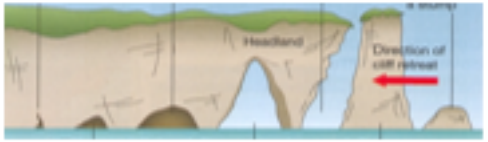
- Waves approach the beach at an angle due to the prevailing wind.
- Material is therefore moved up the beach at an angle by the swash.
- The waves (backwash) move back down the beach at a right angle.
- This causes sediment to move in a zig zag motion along the coast.



Cliffs are produced through hydraulic action and abrasion, where destructive waves erode the cliffs to create a wave cut notch. As this notch is eroded, the cliff above becomes unstable, collapses and is removed by waves.

Headlands and bays

- Form on a discordant coastline (where bands of different strengths run perpendicular to the coastline).
- Bands of more resistant (hard) rock so erode more slowly and form headlands.
- Bands of less resistant (soft) rock erode more quickly and form bays.



Cracks, caves, arches and stumps

- Cracks in the headland are opened up by hydraulic action to form caves.
- Caves are eroded all the way through to form arches.
- Roof of an arch collapses leaving a stack.
- Abrasion erodes the stack into a stump.

Spit (depositional landform)

- Longshore drift occurs along the coast
- Coastline changes direction→ sediment is deposited to form a spit.
- Saltmarshes form behind the spit due it being sheltered.
- Spit may curve due to wind blowing from another direction.
- If there is a river, this will remove the sediment and stop the spit growing.

Weathering:

Mechanical (freeze-thaw): Water enters a crack in the rock, temperatures drop below 0°C, water freezes and expands, expands the crack in the rock.
Chemical: Acidic rain water dissolves rock.
Biological: Plant root or burrowing animal goes into crack and expands it.

Mass movement: Rotational slumping

After a period of rainfall, the permeable rock (absorbs rainfall) becomes heavy. Waves erode the base of the cliff creating a wave-cut notch. The weight of the saturated cliff causes it to slump.

Coastal Defences

Sea wall	+ Reflects wave energy → effective. - Eyesore, expensive (£6k/m), prevents access to beach.	**Beach nourishment**	+ Natural, attractive - Needs replacing over time (costly)
Groynes	+ Prevents LSD. - Eyesore.	**Dune stabilisation**	+ Cheap to plant - Can get damaged in storms
Gabions	+ Absorbs wave energy - Difficult to transport boulders, eyesore.	**Salt marsh creation**	+ Creates a habitat for rare species, increases biodiversity, natural, increases tourism - Floods surrounding land e.g. farmland
Rock armour	+ Looks natural, absorbs wave energy - Difficult to transport boulders		

Case study: Holderness, The UK (HIC)

- Sea wall at Bridlington (expensive houses behind it)
- Mappleton (popular coastal town) has rock groynes
- Fraisthorpe (caravan park) has no coastal defences and eroding quickly

Shoreline Management Plans (SMPs)

- Hold the line
- Retreat the line
- Do nothing

Activities and groups of people at the coastline

- **Tourists** visiting the beach on holiday. They may own holiday homes there.
- **Local residents** and their properties at the coast
- **Business owners.**
- **Farmers** who have land near the coast.
- **Environmentalists** who are protective of ecosystems at the coast.

Case study: Tuvalu (LIC), Pacific Ocean

- 26% of people below poverty line.
- Crops are being contaminated with saline water and dying.
- Having to import water/food (expensive).
- Not enough food to feed livestock → farmers losing income.
- Making sea defences out of recycled materials.

Y10 Knowledge Organiser: Climate change

Overview of topic

What is climate change?
What are the causes of climate change?
What are the consequences of climate change in the UK?
What are the consequences of climate change in LICs?
What are the responses to climate change?
How can we reduce the effects of climate change?

Keywords

Climate – The long term average weather conditions (Measured over 30 years)
Global warming – The rise in average temperatures around the world
Climate change – The increase of extreme weather events around the world
Anthropogenic climate change – The human causes of climate change by the burning of fossil fuels.
Carbon footprint - The amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organisation, or community.
Desertification – When a dry region become even drier, often because the area has been stripped of vegetation (plants) leading to soil erosion.
Greenhouse effect – The trapping of the suns' warmth in the atmosphere, acting like a blanket around the Earth.

Key concept #1

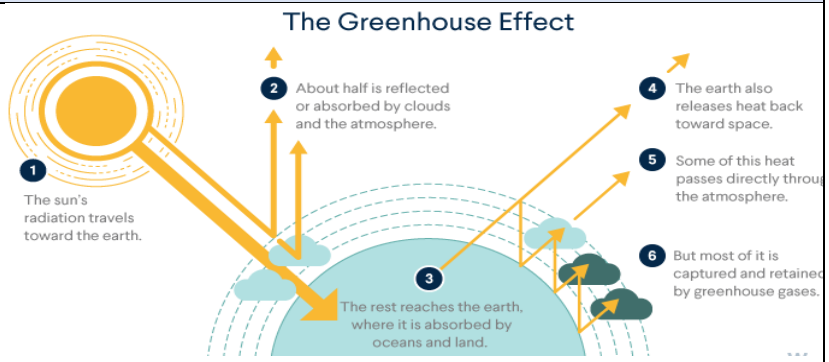
What is the difference between natural climate change and anthropogenic climate change?

Anthropogenic climate change is defined by **the human impact on Earth's climate** while natural climate change are the natural climate cycles that have been and continue to occur throughout Earth's history. The earth's climate is changed through natural causes like **volcanic eruptions, ocean currents, the Earth's orbital changes and solar variations**.

Key concept #2

What are the effects of climate change around the world?

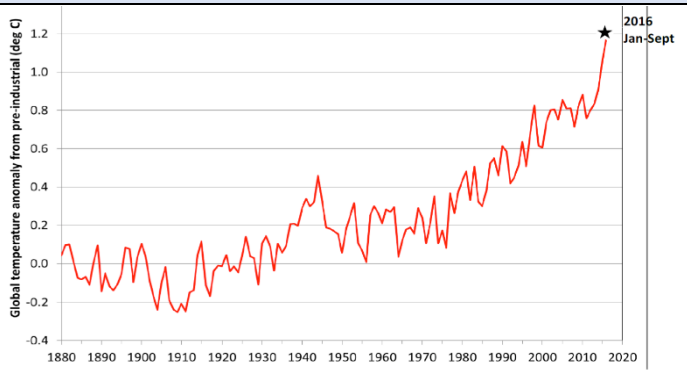
- More violent storms
- Melting of sea ice
- More droughts
- Sea level rise
- Coral bleaching
- Crops will die, causing famine.
- Changes in weather patterns
- Habitat loss for wildlife
- Increased risk of disease



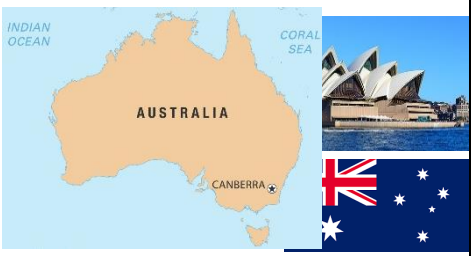
Key concept # 3 *How can we adapt to climate change?*

Many families may choose to become <u>environmental migrants</u> and move their entire families to greener areas where there is more water and vegetation for their animals (like in Ghana). Low-lying islands, like the Maldives have paid to add sand to some islands to stop them becoming underwater by 2050.
Re-planting trees can reduce the amount of CO_2 and increase oxygen levels instead. This can also prevent desertification.

Geographical Skill – Interpreting a line graph



The graph shows that global average temperatures have increased by 1.2°C from 1880 to 2016. Average temperatures increased the most from 1970 – 2020. This is shown on the graph by the line being steepest between 1970 and 2020.

Case study #1 The UK	Case study#2 Australia
In the UK it is predicted that there will be more hot summer days. However, summer will also be drier with more risk of heatwaves and hosepipe bans. There is also a bigger risk of sudden heavy downpours predicted for summer, which could cause flash floods (for example Boscastle). More extreme weather events are predicted including: heatwaves, drought, storms and gales. The UK is predicted to have heatwaves in summer every other year by 2050. The UK is already feeling the effects of climate change with the top 10 hottest years on record all happening between 2002 and 2020.  Average temperatures have already increased by 0.8°C in the last 50 years alone. The number of homes at risk of flooding is set to increase by 4 times by 2080.	Australia is expected to have an increase in annual (yearly) temperature of 1.3°C by 2030. More extreme droughts are predicted and this brings an increased chance of wildfires, which can have a devastating effect on wildlife. Average temperatures could increase by up to 5°C by 2050 if no effort is made to reduce greenhouse gases entering the atmosphere. Western Australia will face more water shortages while the Great Barrier Reef, one of the natural wonders of the world has lost between 30-50% of its coral due to a sudden increase in sea temperature.   
Homework and enrichment opportunities	**8 marker example (WAGOLL)**
Look at the paris agreement and the IPCC report https://climate.nasa.gov/evidence/ Follow any news reports on COP 2. This may decide the next round of promises to reduce greenhouse gas emissions in the future. *What would happen if everyone on Earth reduced the amount of meat they eat?* *Would it be better if everyone was vegetarian or vegan?* Research 2 ways in which the global climate has changed in the past 20,000 years. (If possible what evidence can prove this?) Measure your family carbon footprint and create an action plan for your family to reduce their carbon emissions.	With reference to a location you have studied, explain the impacts of climate change. Climate change is the long term changes in the average weather of an area. One economic impact of climate change is that the government will have to spend more money to protect houses from flooding by building flood defences. In the UK, it is predicted that the number of homes at risk of flooding it set to increase by up to 4 times. Therefore this could lead to peoples houses being destroyed, and losing all of their important valuables. Shop owners would also lose their shops and ant products they have inside. In coastal areas, local tourist businesses are likely to take a long time to recover, and may have to cut hours for local workers so they can afford to repair the shop. The weather patterns are likely to change as well, meaning that some animals will have to migrate and move to find the right weather to survive. The UK will have more heatwaves in the future and this could be bad as the risk of wildfires, like the 2018 summer, happening again and destroying grazing and farmland for sheep.

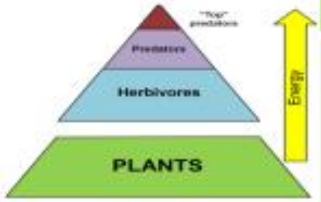
Topic 4
Sustaining Ecosystems

What is an Ecosystem?

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

Ecosystem's Components

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



Food Chains & webs

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

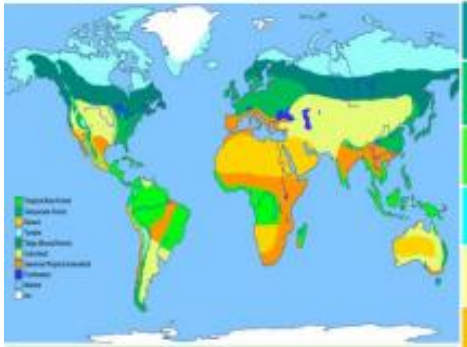
Nutrient cycle

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

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

Biomes

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



Coniferous forest
Deciduous forest
Tropical rainforests
Tundra
Temperate grasslands
Tropical grasslands
Hot deserts.

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

Tropical Rainforest Biome

Distribution of Tropical Rainforests

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

Convectional rainfall

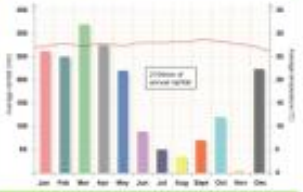
1. The roots of plants take up water from the ground and the rain is **intercepted** as it falls.
2. As the rainforest heats up, the water evaporates into the atmosphere.
3. Finally, the water condenses and forms clouds to make the next day's rain.

Rainforest nutrient cycle

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

Climate of Tropical Rainforests

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

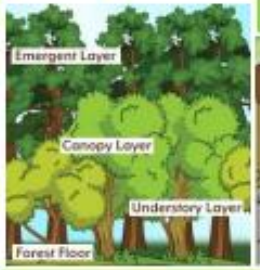


Interdependence in the rainforest

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

Layers of the Rainforest

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



Rainforest soil profile - latosols

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

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