









# 2021-22 CURRICULUM MAP FOR GEOGRAPHY YEAR 11

HALF TERM 1: PEOPLE OF THE PLANET	
<p><b>Key idea 1: The world is developing unevenly</b></p> <ul style="list-style-type: none"> <li>• Development is a process of change and improvement</li> <li>• Economic development is about the improvement that has been made by a country in terms of wealth</li> <li>• Social development is to do people and improving their quality of life</li> <li>• Environmental development recognises the importance of the natural world and how humans need to protect it</li> <li>• Sustainable development means that the needs of the present will be met while protecting the needs of the future</li> <li>• Development indicators are used to show the progress of a country in meeting a range of economic, social, and environmental goals.</li> <li>• Social indicators measure what life is like for the people - literacy rate, birth rate, life expectancy, infant mortality</li> <li>• Economic indicators focus on money and a country's wealth - GNI per capita, employment type, GDP per capita, absolute and relative poverty</li> <li>• There are three ways of categorising a country's level of development: Low-income developing countries (LIDCs) e.g. Bangladesh and Haiti, Emerging and developing countries (EDCs) e.g. India and Brazil and Advanced countries (ACs) e.g. UK and USA</li> <li>• The development gap refers to the differences between countries at different levels of development</li> <li>• Factors that show this development gap include health, education, standards of living</li> </ul>	 <p>Core textbook pages 152 to 153 - 'Definitions of development'</p> <p>Core textbook pages 154 to 157 – 'Development indicators'</p> <p>Core textbook pages 158 to 160 – 'The consequences of uneven development'</p> <p>Core textbook pages 161 to 164 – The reasons for uneven development'</p> <p>Core textbook pages 165 to 177 – 'Ethiopia's economic development'</p> <ul style="list-style-type: none"> <li>• Information sheet on employment structure</li> <li>• GeoActive: Measuring development: HDI and ICT</li> <li>• Geofile: Development indicators</li> <li>• Geofile: Development issues in Ethiopia</li> <li>• Geofile: Case studies of African countries at a very low level of development</li> </ul>
<p><b>Key idea 2: There are many causes for uneven development</b></p> <ul style="list-style-type: none"> <li>• Physical factors affecting development include natural resources, climate, natural hazards, location and terrain</li> <li>• Human factors affecting development include conflict, disease and healthcare, colonialism, politics</li> <li>• Aid is when a country, organisation or individual gives resources to a country. This may be money, products, training or technology.</li> <li>• Different types of aid are official government aid, multilateral aid, bilateral aid, voluntary aid: charities like Oxfam work in specific places.</li> <li>• Aid can be either short-term or long-term</li> <li>• Goat Aid is an example of sustainable aid where families in Ethiopia were given a goat by Oxfam.</li> <li>• The goat then provided them with manure to help fertilise their crops, milk to improve their health and could give birth to other goats which could be sold</li> </ul>	 <p>Students will complete at least five extended pieces of writing:</p> <ul style="list-style-type: none"> <li>• Examine how the exploitation of natural resources has caused uneven development</li> <li>• Analyse the influence of one aid project on the economic development of an LIDC or EDC</li> <li>• Suggest how aid can both promote and hinder development</li> <li>• Explain how trade affects the economic development of an LIDC or an EDC you have studied</li> <li>• Explain how development indicators show evidence of economic development</li> </ul>
<p><b>Key idea 3: Many factors contribute to a country's economic development - Case study: Ethiopia</b></p> <ul style="list-style-type: none"> <li>• Ethiopia is a country located in the NE of Africa.</li> <li>• It is landlocked and shares borders with five countries.</li> <li>• Ethiopia is categorised as an LIDC and in 2015, Ethiopia had a GNI per capita of just US\$505.</li> <li>• The landscape of Ethiopia varies dramatically. In the west are mountains with thin soils and active volcanoes, and in the east are lowlands that are fertile and suffer with mosquitos and malaria.</li> <li>• The climate of the country is dominated by the rainy seasons (one or two extended periods of rain) although rainfall is unreliable. Temperatures are high all year.</li> <li>• Ethiopia also has a wide range of ecosystems across the country, including tropical grasslands, deserts and wetlands. It is famous for its savannahs which have lions, zebras, gorillas and flamingos.</li> <li>• Ethiopia has small amounts of mineral resources such as gold, platinum and copper, as well as reserves of natural gas. However, the development of its natural gas, oil and mineral resources has not been a key driver in the country's economic growth.</li> </ul>	 <p>Students will have four opportunities to collaborate with peers:</p> <ul style="list-style-type: none"> <li>• Think, pair, share to clarify the term development and the underlying terms of economic, social and environmental development, leading to sustainable development</li> <li>• Class discussion to explain how to use development indicators to show development</li> <li>• Think, pair, share to evaluate the success of Goat Aid</li> <li>• Extended pair work to identify the factors affecting Ethiopia's economic development</li> </ul>
	 <ul style="list-style-type: none"> <li>• History: colonisation of countries in Africa</li> <li>• RS: social development and human rights in Africa</li> <li>• English: comprehension of written articles and use of PEEL to structure paragraphs</li> <li>• Mathematics: drawing graphs and analysing data</li> </ul>





# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR 11

<ul style="list-style-type: none"> <li>• Urbanisation is the increasing percentage of people living in towns and cities.</li> <li>• Rapid urbanisation is taking place in EDCs and LIDCs because of rural to urban migration and internal growth</li> <li>• Rural to urban migration is caused by push and pull factors.</li> <li>• Push factors are reasons to leave an area and include natural disasters, poor wages and war.</li> <li>• Pull factors are reasons to move to an area and include more, higher paid jobs or better education and healthcare.</li> <li>• Internal Growth is when the birth rate is higher than the death rate.</li> <li>• This happens when young people move to the cities to find work. These people then have children, increasing the urban. Also, better healthcare is found in cities and this reduces the death rate.</li> <li>• Economic consequences of rapid urbanisation - not enough jobs so high unemployment, informal work and poor education meaning a skills shortage for the jobs available.</li> <li>• Social consequences of rapid urbanisation - not enough houses so people live in squatter settlements, infrastructure is poor or non-existent, people lack basic services e.g. clean water and electricity which causes poor health and high levels of crime.</li> <li>• Environmental consequences of rapid urbanisation - waste disposal systems and sewage networks are poor and cannot keep pace with population growth, rubbish is not collected and may build up, damaging the environment and potentially becoming toxic and sewage and chemicals enter the rivers, harming wildlife.</li> </ul>		<ul style="list-style-type: none"> <li>• Explain two consequences of rapid urbanisation in LIDCs</li> <li>• To what extent have sustainable strategies overcome one of the city's challenges?</li> </ul>
<p><b>Key idea 6: Cities have distinct challenges and ways of life, influenced by its people and their culture - Case Study: Rio de Janeiro</b></p> <ul style="list-style-type: none"> <li>• Rio de Janeiro is situated in the SE of Brazil, on the Atlantic coast.</li> <li>• Brazil is a EDC (Emerging and Developing country).</li> <li>• Until 1960 Rio de Janeiro was the capital city of Brazil and has a population of nearly 14 million.</li> <li>• Rio de Janeiro is famous for its carnival, Copacabana beach, the statue of Christ the Redeemer and for hosting the 2014 FIFA World Cup and the 2016 Olympic Games.</li> <li>• It has lots of factories making chemicals, medicine, clothing and furniture that is sold all over the world; and it has many of the head offices of important businesses including banking, insurance and finance.</li> <li>• Rio de Janeiro's character comes from when the Portuguese first colonised Brazil in the 1500s, looking for diamonds and gold.</li> <li>• The Portuguese brought African slaves to work from them and their combined influence can be seen today with the language of Brazil (Portuguese), the religion (Catholic) and the African influence of music and dance.</li> <li>• The growth of the city is linked more to the internal migration from the countryside to the city.</li> <li>• This has led to rapid urbanisation and caused severe overcrowding and a shortage of housing.</li> <li>• The city cannot grow because of physical factors - there are mountains to the north and west, and sea to the south and east.</li> <li>• Consequently, squatter settlements, also known as favelas, have been built on these dangerous slopes at the edge of the city.</li> <li>• The way of life in Rio de Janeiro is very different from in the UK.</li> <li>• Rio is known as the culture capital of Brazil because of its combination of historic and modern architecture, its numerous museums, the celebration of music and literature and the carnival.</li> <li>• It is an extremely relaxed city, where people tend to dress casually and comfortably.</li> <li>• The people in Rio de Janeiro call themselves Cariocas.</li> <li>• Cariocas are also extremely friendly people and they are very comfortable with physical contact, such as kissing on the cheek (a typical greeting), hugging and back-patting.</li> <li>• Their passions tend to include the beach, sports and partying.</li> </ul>		<p>Students will have four opportunities to collaborate with peers:</p> <ul style="list-style-type: none"> <li>• Think, pair, share to identify the characteristics that categorise London and Dubai as World Cities</li> <li>• Class discussion to describe and explain the global pattern of urban growth</li> <li>• Pair work to identify the consequences of rapid urbanisation in Lagos</li> <li>• Extended pair work to identify the distinct challenges and ways of life in Rio de Janeiro</li> </ul>
		<ul style="list-style-type: none"> <li>• History: colonisation of countries in South America and the slave trade</li> <li>• RS: spread of religion to colonised countries</li> <li>• Mathematics: drawing graphs and analysing data</li> <li>• English: comprehension of written articles and use of PEEL to structure paragraphs</li> <li>• Science: ecosystems and biomes</li> </ul>



# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR II

## Contemporary Challenge 1: Housing

- There are 500,000 homeless street dwellers and over 1 million people live in the favelas (illegal squatter settlements).
- Rochina is one of the biggest favelas, with a population of 100,000.
- Most favelas in Rio have been built on hillsides too steep for normal housing.
- They are poorly built and often have no electricity or running water.
- Favela's are seen as areas linked with organised crime, violence and drugs.

## Contemporary Challenge 2: Traffic

- Mountains surround the city, so traffic is channeled along limited number of routes.
- This causes severe congestion, pollution and noise.
- Favelas are unplanned and roads here are narrow and poorly built.

## Contemporary Challenge 3: Waste management / pollution

- Factories in the city and vehicles release gases into the air.
- Beaches also very polluted by litter and sewage.
- There is no rubbish collection in the favelas so huge amounts of waste are created and left to build up.
- Water supplies are polluted by open sewers and this causes health hazards for the people.

## Sustainable future: Housing - The Favela Bairro Project

- The Favela Bairro Project was started in 1995 and helped 250,000 people.
- The Rochina favela was included in the project
- Social improvements – adult education classes to improve literacy and services to help drug addicts, alcoholics and victims of domestic violence
- Economic Improvements - residents could apply to legally own their properties and training schemes were started to help people get better jobs
- Environmental Improvements – the replacement of wooden buildings with brick, the widening and paving of streets to allow easier access (especially for emergency services) and the provision of basic services such as clean water, electric and weekly rubbish collection.
- Successes of the project - standard of living has improved and property values have doubled.

## ECOSYSTEMS OF THE PLANET

### Key idea 1: Ecosystems consist of interdependent components

### Key idea 2: Ecosystems have distinct distributions and characteristics




- An ecosystem is a natural system in which the living parts e.g. plants and animals (biotic) and non-living parts e.g. water, air, sunlight, soil and rock (abiotic) interact.
- A large-scale ecosystem is known as a biome. They have types of plants and animals that are unique to them.
- Biomes cover a wide area and are identified by their climate, soils, plants and animal species.
- Each of these factors is reliant upon all of the others e.g. the soils affect the trees by providing nutrients, whilst the trees affect the soil by providing shade from the sun.
- This reliance / link is known as interdependence.

## Polar Regions

- Arctic (North Pole) and Antarctic (South Pole).
- Long, cold winter and short cool summer. Under  $-26^{\circ}\text{C}$ , as low as  $-62^{\circ}\text{C}$  in Antarctica. Very dry, under 250mm a year.
- Treeless area. Low shrubs, mosses and grass.
- Arctic Land: polar bears and wolves.
- Arctic Sea: walrus, whales, elephant seals.
- Antarctica Land: penguins and seals.
- Antarctica Sea: killer whales.



# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR 11

HALF TERM 3: ECOSYSTEMS OF THE PLANET	
<p><b>Key idea 1: Ecosystems consist of interdependent components</b></p> <p><b>Key idea 2: Ecosystems have distinct distributions and characteristics</b></p> <p>Tropical Rainforest</p> <ul style="list-style-type: none"> <li>Found between the Tropics of Cancer and Capricorn.</li> <li>High and constant temperatures (26° to 28°). High temperatures mean high rainfall (over 2000mm) so they are hot and humid places.</li> <li>The climate is ideal for plant growth and the growing season is all year round. Vegetation is mainly trees (mahogany and teak).</li> <li>Most animals and insects live in the canopy and include toucans, jaguars, monkeys, frogs and snakes.</li> </ul> <p>Coral reefs</p> <ul style="list-style-type: none"> <li>Found within 30° N and S of the equator in the tropical and subtropical oceans.</li> <li>Ocean temperatures average 18°C. Water needs to be shallow (less than 30m) and clear.</li> <li>Relatively small range of plant life – algae grows on coral to provide it with energy. Sea grasses are flowering plants that provide shelter for reef animals.</li> <li>Coral is an animal made up of thousands of polyps. 4000 species of fish including starfish, clams, eels and parrot fish. Mammals include dugongs.</li> </ul> <p>Tropical grasslands</p> <ul style="list-style-type: none"> <li>Known as savannah and found between 5° and 30° N and S of the equator.</li> <li>Border between rainforest and hot desert- always hot (25°C) but rainfall varies. Usually a wet season and a dry season.</li> <li>Baobab trees have large trunks to store water for dry season. Pampas grass grows quickly in wet season.</li> <li>Herbivores include antelopes, elephants, zebra, rhinos and wildebeest. Carnivores include lions, hyenas and leopards.</li> </ul> <p>Temperate grasslands</p> <ul style="list-style-type: none"> <li>Found between 40° and 60° N and S of the equator.</li> <li>Hot summer and cold winters: 40°C to -40°C. Average rainfall is 250-750mm and mostly falls in the summer growing season.</li> <li>Grasses and small plants with few trees. Small trees near rivers e.g. willow.</li> <li>Kangaroo, bison, antelope. Rabbits and moles. Wolves. Large birds e.g. eagles</li> </ul> <p>Temperate forests</p> <ul style="list-style-type: none"> <li>Found between 40° and 60° N and S of the equator. Includes the UK.</li> <li>Four seasons. Warm summers and cool winters. Rain all year: up to 1500mm.</li> <li>Broad leaved trees (oak); shrubs (brambles); undergrowth (ferns) and some evergreen (fir).</li> <li>Mammals (foxes and squirrels); birds (owls and pigeons); insects (beetles) and fish (salmon)</li> </ul> <p>Hot deserts</p> <ul style="list-style-type: none"> <li>Cover 20% of the earth. Found between 5° to 30° N and S of the equator.</li> <li>Less than 250mm rainfall, some years none. Extreme temperatures - 45°C in the day to 0°C at night</li> <li>Little vegetation due to lack of rain. Cacti have thick, spiky, waxy leaves to reduce water loss and to stop animals from trying to eat them.</li> <li>Lizards, snakes, insects, rats. Camels: adapt to tolerate dehydration and humps store fat and water</li> </ul> <p><b>Key idea 3: There are major rainforests in the world.</b></p> <p><b>Key idea 4: Biodiverse ecosystems are under threat from human activity</b></p> <ul style="list-style-type: none"> <li>Tropical rainforests are found in a broad belt through the Tropics, from Central and South America through central parts of Africa, South East Asia and into the northern part of Australia</li> </ul>	 <p>Core textbook pages 124 to 133 – ‘World’s major biomes’</p> <p>Core textbook pages 134 to 141 – ‘The Peruvian Tropical Rainforest’</p> <p>Core textbook pages 142 to 147 – ‘The Andros Barrier Reef’</p> <ul style="list-style-type: none"> <li>Information sheet on the ITCZ</li> <li>GeoActive: Case study of a rainforest zone: Amazonia</li> <li>GeoActive: Brazilian rainforest destruction: an update</li> <li>Information sheet on sustainable management of the rainforest</li> <li>Geofile: Coral reefs</li> <li>Information sheet on ecotourism on the Andros Barrier Reef</li> </ul>
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# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR II

- Major tropical rainforests include the Amazon, the Zaire Basin and Queensland in Australia
- There are three significant processes within tropical Rainforests – the water cycle, the carbon cycle and the nutrient cycle

## The Water Cycle

- As the rainforest heats up in the morning, the water evaporates to form clouds. The clouds then rain the next day.
- This is called convectional rainfall.
- Water is lost through the pores in leaves and then evaporated by heat through evapotranspiration. The roots of plants take up some water and then it is lost again through transpiration.
- The removal of trees means that there is less moisture in the atmosphere. This leads to less rainfall and can sometimes lead to drought.

## The Carbon Cycle

- Rainforests take in carbon dioxide from the air as they photosynthesise and grow.
- With their large leaves, plants and trees store a lot of carbon which means they have role to play in reducing global warming and climate change.
- When trees and plants are burned the carbon is released back into the atmosphere and adds to the greenhouse effect.

## Nutrient cycling

- The rainforest nutrient cycling is rapid.
- 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 rainforest's many fast-growing plants, they do not remain in the soil for long and stay close to the surface of the soil.
- If vegetation is removed, the soils quickly become infertile and vulnerable to erosion.

## Tropical rainforest case study: The Peruvian Amazon

- Peru is located south of the Equator in the Southern Hemisphere.
- Peru shares borders with five different countries and has the South Pacific Ocean to the west.
- It has the second largest portion of the Amazon after Brazil and the third largest rainforest in the world.
- About 44% of all bird species and 63% of all mammal species live here.
- The Peruvian rainforest is of great value to humans - timber comes from many valuable hardwood trees including mahogany for furniture
- There are valuable minerals such as oil, natural gas and gold
- The plants have medicinal qualities that scientists believe can help cure cancer
- The Amazonian tribes live a sustainable life in the jungle.
- The Peruvian rainforest is of great value to planet - there is huge biodiversity (Peru has nearly 3000 known species of fauna, 16% which are only found in Peru)
- The water cycle relies on the trees in the rainforests to give off water through transpiration, increasing humidity and rainfall.
- The climate is dryer when rainforests are cut down and the carbon cycle is reliant on the rainforests as the trees absorb CO<sub>2</sub> when they photosynthesise and store a lot of carbon.
- If trees are cut down and burnt, the carbon is released into the atmosphere increasing the greenhouse effect.
- The Peruvian rainforest is under threat – timber, energy, gold mining, agriculture and highways
- Strategies to manage the rainforest include conservation and protection, creating National Parks and Reserves, ecotourism and the Purus-Manu Conservation Corridor



- Mathematics: drawing graphs and analysing data
- English: comprehension of written articles and use of PEEL to structure paragraphs
- Science: ecosystems and biomes



# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR 11

**Key idea 4: There are major coral reefs in the world.**

**Key idea 5: Biodiverse ecosystems are under threat from human activity**

- Coral reefs are found within 30° N and S of the equator in the tropical and subtropical oceans.
- Major coral reefs include the Andros Barrier Reef and the Great Barrier Reef
- Nutrient cycling is an important process in the coral reef
- It involves the flows of nutrients (foods) within the coral reef ecosystem
- Fish excrete ammonia into the water which can also be absorbed by the coral. Coral can digest bacteria from upwelling on the ocean floor;
- Zooxanthellae, algae, live within to the coral. They convert energy from the sun into food for the coral.
- Coral produces waste nitrogen which fertilise the algae. The coral also provides somewhere for the zooxanthellae to live.
- This is a symbiotic relationship
- Corals also feed on zooplankton to get nutrients. Zooplankton obtain nutrients by consuming phytoplankton, who survive on energy from the sun.

Case study: a coral reef – The Andros Barrier Reef

- The Andros Barrier Reef is part of an extensive coral reef system in the Bahamas, off the southeast coast of Florida, USA.
- It is the third most extensive coral reef system in the world and stretches for approximately 200 km.
- Over 164 species of fish and coral make up the reef community. They include: the reef shark, rock lobster, red snapper and the green turtle.
- The Andros Barrier reef is of great value to humans - tourism is thriving as there are recreational activities such as fishing, snorkelling and scuba diving. This brings in over \$150 million a year for the local economy
- The fish are caught and sold both within the Bahamas and abroad. Lobster and snapper earn locals millions of dollars
- There are medicinal chemicals released by coral species may help cure various diseases including asthma.
- The Andros Barrier reef is of great value to the planet - coral reef is successful breeding grounds as they shelter the fish to breed, especially in mangrove forests
- It is a natural coastal protection that reduces coastal erosion and flooding as the shallow water causes waves to break before they reach the land
- The reef is used for by scientists for research as it is one of the healthiest in the world.
- The Andros Barrier reef is under threat – overfishing, tourism, climate change, land-based pollution and marine-based pollution
- Strategies to manage the reef include creating National Parks and Reserves such as the Andros National Park and the Crab Regeneration Reserve, The Exuma Cays Land and Sea Park and ecotourism

## HALF TERM 4: ENVIRONMENTAL THREATS TO OUR PLANET

**Key idea 1: The climate has changed from the start of the Quaternary period**

- Climate change: changes in the long-term temperature and precipitation patterns that can either be natural or linked to human activities
- Quaternary geological period: the most recent geological period covering the last 2.6 million years, during which time there were several warm and cold periods
- Glacial period: historic cold periods resulting in the build-up of snow and growth of ice sheets and glaciers
- Inter-glacial period: historic warm periods in between glacial periods when conditions are like they are today
- There have been significant changes in over the last 1000 years
- 1000 to 1300: Medieval warm period where temperatures in the North Atlantic area were warm





Core textbook pages 200 to 205 – ‘Climate change’  
 Core textbook pages 206 to 207 – ‘The enhanced greenhouse effect’  
 Core textbook page 208 – ‘Consequences of climate change’  
 Core textbook page 210 – ‘Extreme weather and climate change’  
 Core textbook pages 212 to 215 – ‘Global circulation of the atmosphere’  
 Core textbook pages 218 to 219 – ‘El Nino and La Nina’  
 Core textbook pages 220 to 222 – ‘Hurricanes’  
 Core textbook pages 223 to 227 – ‘Drought’

- GeoActive: Recent evidence of a warming world
- Geofile: Global warming: Fact, fiction or myth



# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR 11

<ul style="list-style-type: none"> <li>1300 to 1870: Little Ice Age where winters were particularly cool. Many crops failed as it was too cold to farm. There were “Frost Fairs” when the Thames froze</li> <li>1900 to present: temperatures have increased by 0.85°C</li> <li>There are four methods of evidencing climate change – global temperature data, ice core analysis, tree rings, paintings and diaries</li> </ul>		<ul style="list-style-type: none"> <li>Geofile: Global warming: hopes and imperatives</li> <li>Geofile: Likely impacts of climate change in vulnerable regions</li> <li>Case study: Effects of sea-level rising on the Maldives</li> <li>GeoActive: Sea-level change: impacts and strategies</li> </ul>
<p><b>Key idea 2: There are a number of possible causes of climate change</b></p> <ul style="list-style-type: none"> <li>Natural changes in climate include the Milankovitch (eccentricity, precession and axial tilt), volcanic and solar flares</li> <li>The greenhouse effect is a term used to describe how the atmosphere controls the Earth’s climate</li> <li>The atmosphere allows the heat from the Sun (short-wave radiation) to pass through to heat the Earth’s surface</li> <li>The Earth’s surface then gives off heat (long-wave radiation)</li> <li>Heat is trapped by greenhouse gases - methane, carbon dioxide and nitrous oxide - which radiate the heat back towards Earth</li> <li>This process heats up the Earth.</li> <li>The enhanced greenhouse effect describes how humans have added to the amount of greenhouse gases in the atmosphere, making the blanket around the Earth thicker, and causing temperatures to rise even more.</li> <li>The three main greenhouse gases are carbon dioxide, methane and nitrous oxides</li> <li>Human activities responsible for this include burning fossil fuels and deforestation resulting in more carbon dioxide, rearing cattle and growing rice resulting in more methane and vehicles and factories producing nitrous oxides.</li> </ul> <p><b>Key idea 3: Climate change has consequences</b></p> <ul style="list-style-type: none"> <li>Climate change is resulting in an increase in the frequency and severity of extreme weather events.</li> <li>An increased rate of evaporation from the Earth’s oceans is powering more storms and changing weather patterns.</li> <li>Places that are hot may be getting hotter, and places that are dry may experience greater droughts. Examples include the Australian ‘Big-dry’ from 2002 and the Somerset Levels flood in the UK, 2014.</li> <li>Rising temperatures is leading to rising sea levels. This is being caused by ice-caps melting and thermal expansion of the water</li> <li>Rising sea levels has global economic, social and environmental impacts</li> <li>Economic impacts include many world cities including New York, could be affected by the flooding and transport infrastructure (roads, railways etc.) damaged by floodwaters.</li> <li>Social impacts include 600 million people live in coastal areas less than 10m above sea level and houses will be flooded and migration and overcrowding in low-risk flood areas due to flooding. Environmental impacts include damage to coastal ecosystems such as mangrove swamps and increased coral bleaching.</li> </ul> <p>Rising sea levels – case study: The Maldives</p> <ul style="list-style-type: none"> <li>The Maldives is a group of 1190 Islands in the Indian Ocean, 199 of which are inhabited by about 300,000 people.</li> <li>The average island is 1.5m above sea level, but 80% of land is below 1m above sea level.</li> <li>Economic effects of sea level rise include loss of tourism as hotels are flooded and loss of fishing grounds as ports are destroyed.</li> <li>Social effects include houses flooded and freshwater polluted by the salt from the sea.</li> <li>Environmental effects include wildlife habitats flooded and soil ruined by salt from the sea.</li> </ul>		<p>Students will complete at least eleven extended pieces of writing:</p> <ul style="list-style-type: none"> <li>Using evidence from Fig.5, explain how human activity creates the enhanced greenhouse effect</li> <li>Explain how El Nino/La Nina leads to drought in your chosen study area</li> <li>Explain how parts of the global circulation of the atmosphere leads to extreme weather conditions such as wind</li> <li>Suggest how an increased number of tropical storms can be linked to climate change</li> <li>Discuss the effects of drought on people and the environment in your case study area</li> <li>Explain how human activity creates the enhanced greenhouse effect</li> <li>Suggest how global warming could affect the frequency of drought in the future</li> <li>Describe how people in your case study area have adapted to the drought and comment on the success of their methods</li> <li>Explain how the global circulation of the atmosphere is controlled by the movement of air between the poles and the Equator</li> <li>Outline two theories of natural causes of climate change</li> <li>Assess which evidence of global climate change is considered to be the most reliable</li> </ul>
<p><b>Key idea 4: The global circulation of the atmosphere controls weather and climate</b></p> <ul style="list-style-type: none"> <li>There are large-scale circular movements of air all over the Earth’s surface.</li> </ul>		<p>Students will have six opportunities to collaborate with peers:</p> <ul style="list-style-type: none"> <li>Think, pair, share to assess the reliability of the different sources of evidence for climate change</li> <li>Pair work to identify the key characteristics of the Maldives, impacts of sea-level rising and to evaluate the response</li> <li>Pair/group work to research and present an example of extreme weather</li> <li>Class discussion on impact of climate change on tropical storms</li> <li>Class discussion on the impact of climate change on droughts</li> <li>Pair work to identify the key factors causing the Australia’s ‘Big Dry’, impacts of the drought and to evaluate the response</li> </ul>





# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR II

- They transport heat from the tropical regions at the Equator (where the Earth gets more heat from the sun) to the poles.
- The Earth is divided by the Equator into the Northern Hemisphere and the Southern Hemisphere.
- In each hemisphere there are 3 circular movements of air called 'cells': the Hadley cell, the Ferrel cell and the Polar cell.
- The 3 cells play an important role in creating distinct climate zones.
- The major climatic zones are (1) Temperate Climate; (2) Tropical Climate; (3) Sub-tropical (Desert) Climate and (4) Polar
- The Hadley Cell: the largest cell that extends from the equator to 30° North and South. In this cell, winds meet near the Equator and the warm air rises, causing thunderstorms. The drier air then flows out towards 30°, before sinking over subtropical areas.
- The Ferrel Cell: the middle cell that extends from the edge of the Hadley cell at 30° to 60° in the North and South. Air in this cell joins the air at the edge of the Hadley cell. It travels across mid-latitude regions until the air rises along the border of cold air with the Polar cell.
- The Polar Cell: the smallest and weakest cell that extends from the edge of the Ferrel cell to the poles at 90°. In this cell, the air sinks over higher latitudes at the poles and flows towards the mid-latitudes. The air then meets the Ferrel cell and rises.
- Low pressure: Hot air rises. As the warm air cools and condenses to give stormy, cloudy weather.
- High pressure: Cold air sinks and gives clear, dry and calm weather
- Cold place: Vostok, Antarctica - world's coldest temperature recorded was -89.2°C
- Hot place: Al-Aziziyah, Libya – world's hottest temperature recorded was 57.8°C
- Dry place: Death Valley - average annual rainfall of 500mm.
- Wet place: Mawsynram, India – average annual rainfall is 11m.

### Key idea 5: Extreme weather conditions cause different natural weather hazards

- Normal weather conditions in the Pacific: (1) Trade winds over the Western Pacific blow NE towards Australia; (2) Warm air rises over eastern coasts of Australia. It cools and condenses, bringing rainfall; (3) In the eastern Pacific, near Peru, air descends creating high pressure, bringing warm and dry conditions.
- El Nino is a reversal of the trade winds: (1) The trade winds in the western Pacific reverse direction and now travel SW. (2) The warm air now blows towards Peru, creating a low-pressure system here and changing the weather conditions to warm and wet. This brings the risk of flooding (3) The high-pressure system now lies over the eastern coast of Australia, bringing stable and dry conditions. This can lead to droughts.
- La Nina: After an El Nino event, La Nina might happen. La Nina can be described as a more exaggerated version of a normal year. While Australia might experience droughts during El Nino, they could experience flooding with La Nina.
- Tropical storms are extreme low-pressure systems.
- They have strong winds (over 119km/h), heavy rain and a storm surge
- Tropical storms form in between the Tropic of Cancer and the Tropic of Capricorn. They form close to but not on the equator.
- In the north Atlantic Ocean and east Pacific (around the USA) they are called hurricanes.
- In the northwest Pacific (around Japan) they are known as typhoons.
- In the northern Indian Ocean (around India and Bangladesh) they are known as cyclones.
- Tropical storms are formed when there are certain conditions
  
- The average sea temperature is above 26.5°C and to a depth of at least 60m so that evaporation can happen
- At least 500km away from the equator so that the Coriolis effect can give the storm its spin

- Mathematics: drawing graphs and analysing data
- English: comprehension of written articles and use of PEEL to structure paragraphs
- Science: climate change and the triceratops model



# 2022-23 CURRICULUM MAP FOR GEOGRAPHY YEAR 11




- Where there is little wind shear otherwise the hurricane will be ripped apart.
- There are approximately 80 major tropical storms per year; the most powerful happening in the western Pacific.
- They occur from June to November in the northern hemisphere and November to April in the southern hemisphere.
- Scientists disagree whether climate change gas made tropical storms more frequent. However, the number and severity of Atlantic hurricanes have increased since 1995 due to sea surface temperature changes.
- Droughts are when regions have below average precipitation, leading to a shortage of water and negative impacts on vegetation, animal and people.
- They develop slowly and last weeks, months or even years.
- Droughts usually occur in countries with a dry climate so a small decrease in rainfall can have a significant impact e.g. in East Africa (including Somalia, Ethiopia and Kenya) in 2011, when rainfall fell by 30%.
- They can occur anywhere e.g. in the Amazon basin 2002 - 2005, where areas suffered the worst drought in 100 years.
- Droughts can be caused by physical and human factors.
- Physical factors include when El Niño brings descending air and high pressure to Australia, leading to drought; and as global temperature increase, more water is needed to grow crops, but more is also lost through evaporation.
- Human factors include excessive irrigation (using water to grow crops), dam building, deforestation, soil erosion and over farming.
- Although many areas experience drought every year e.g. California, USA, warmer worldwide temperatures are leading to decreased rainfall and more droughts in some areas.
- Droughts are predicted to become more frequent in the UK, potentially occurring every decade.

**Key idea 6: Drought can be devastating for people and the environment**  
**Case study: a drought event caused by El Nino/La Nina – Australia’s ‘Big Dry’, 2002 to 2009**

- There was a variety of causes of the Big Dry, although El Nino was of notable importance
- El Nino: Trade winds reversed, bringing high pressure to eastern Australia. This led to an increase in temperature and a decrease in rainfall.
- Other causes: (1) Australia is part of the driest inhabited continent; (2) although only 23 million people live there, due to a lack of water this is overpopulated; (3) Two million people live on the Murray River who demand water to live; (3) The Murray River also provides water for agriculture in the region – produces 40% of Australia’s agriculture and contains 70% of its irrigated cropland and pasture.
- Economic consequences include (1) water bills rose 20% in 2008; (2) crop production was severely impacted; (3) farmers had to sell cattle as they could not afford to feed them and (4) food prices rose as they had to import.
- Social consequences include (1) people in rural areas had a lack of water which put pressure on city populations and (2) rural suicide rates rose.
- Environmental consequences include (1) grassland turned to scrubland; (2) there was loss of vegetation, wildlife and biodiversity and (3) soil erosion increased as it dried out and blown away.
- Individuals response: Recycling waste water from showers, baths and wash basins (grey water). Farmers claiming financial assistance of \$400-600 per fortnight
- Local government response: subsidising rainwater storage tanks for homes. Legislation to ban car washing and limit showers to 4 minutes.
- National Government response: A new multi-million desalination system built in Sydney. Paying out \$1.7 million a day in drought relief to farmers



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<ul style="list-style-type: none"> <li>Scientists and Environmentalists: More efficient irrigation systems. Calculating the amount of water that can be used sustainably by a state to create a limit that could be traded across states</li> </ul>		
<p><b>HALF TERM 5: REVISION</b></p> <p>Mock exams, previous assessments and student progress checkers (used by the students to RAG rate their understanding of the course) will be used to identify key areas for revision. Consequently, the topics of revision will change each year.</p> <p>Lessons will focus on knowledge retrieval and application of this knowledge to exam questions.</p> <p>Lessons will also focus on recapping and reviewing geographical skills and fieldwork to secure knowledge for Paper 3</p>		<ul style="list-style-type: none"> <li>Core textbook</li> <li>Revision guide</li> <li>Knowledge organisers</li> <li>Revision mind maps</li> </ul>
		<ul style="list-style-type: none"> <li>Past papers</li> <li>Workbook with mark scheme</li> </ul>
		<ul style="list-style-type: none"> <li>Pair and group work to support revision retrieval and application of course knowledge.</li> <li>Pair and group work to practice geographical skills – cartographic, graphical and statistical.</li> <li>Pair and group work to support revision retrieval and application of fieldwork.</li> </ul>



## 11.1: People of the Planet

<b>Advanced country (AC)</b>	countries that share a number of important economic development characteristics including well-developed financial markets, high degrees of financial intermediation and diversified economic structures with rapidly growing sectors
<b>Birth Rate</b>	the number of births per 1,000 people in a year
<b>Bottom-up strategy</b>	development projects that originate in local communities rather than in central government or external agencies
<b>Death rate</b>	the number of deaths per 1,000 people in a year
<b>Dependence</b>	a condition in which something (e.g. a country) is only able to survive by relying on outside support (e.g. from another a country)
<b>Dependency theory</b>	a theory that suggest that the poorer countries of the world supply resources, and also wealth, to the richer countries through an economic system, involving finance and trade, that favours the developed countries. Colonialism was a stage of this and, today, free trade, loans, and the role of big corporations continue this relationship, so that the poor countries are dependent on the rich countries.
<b>Deprived area</b>	an area in which there is a damaging lack of the material benefits that are considered to be basic necessities - employment, housing etc.



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<b>Derelict land</b>	land on which factories or houses have been demolished
<b>Development</b>	economic and social progress that leads to an improvement in the quality of life for an increasing proportion of the population
<b>Disparity</b>	a great difference - e.g. between parts of a country in terms of wealth.
<b>Economic development</b>	the progress made by a country or area in creating wealth through businesses, industry and trade.
<b>Economic migrant</b>	a person who moves in order to find employment
<b>Emerging and developing country (EDC)</b>	countries which neither share all the economic development characteristics required to be advanced or are eligible for the Poverty Reduction and Growth Trust.
<b>Employment Structure</b>	The proportion of people who work in primary, secondary, tertiary or quaternary jobs.
<b>Foreign direct investment (FDI)</b>	when a business from one country invests money in a company in another country or builds its own factory or office in another country
<b>Formal Sector</b>	(of the economy) work where the people are formally employed, with permanent jobs and regular pay (and they pay their taxes)
<b>GDP per Capita</b>	Gross Domestic Product per person, is the total wealth created within a country divided by its population
<b>Global economy</b>	the evolving economic system that increasingly links the countries of the world; it involves the exploitation of resources and the production and marketing of goods and services
<b>Global city</b>	a major urban area that has a significant role in controlling the international flows of capital and trade
<b>Globalisation</b>	the process, led by transnational companies, whereby the world's countries are all becoming part of one vast global economy
<b>GNI per capital</b>	a measurement of economic activity that is calculated by dividing the gross (total) national income by the size of the population. GNI takes into account not just the value of goods and services, but also the income earned from investments overseas.
<b>Grassroots scheme</b>	a scheme that originates within a local community rather than being imposed from above
<b>Human Development Index</b>	a measure of development that uses four economic and social indicators to produce an index figure that allows comparison between countries
<b>Industrial stage</b>	the economic stage when manufacturing industry develops
<b>Industrialisation</b>	the process whereby industrial activity (particularly manufacturing) assumes a greater importance in the economy of a country or region
<b>Infant Mortality Rate</b>	the number of deaths of children (under the age of one) per thousand live births a year
<b>Informal sector</b>	(of the economy) forms of employment that are not officially recognised, e.g. people working for themselves on the streets of developing cities
<b>Infrastructure</b>	the basic physical and organisational structure that are required to support the development of businesses and industry (e.g. roads, power supplies).
<b>Low-income developing countries (LIDC)</b>	countries that are eligible for the Poverty Reduction and Growth Trust. These are the least developed countries.
<b>Life expectancy</b>	the average number of years a person might be expected to live
<b>Megacity</b>	a city with a population of over 10 million
<b>Migration</b>	the process of people changing their place of residence, either within or between countries
<b>Multiplier effect</b>	the chain of sequences in which investment leads to wealth, which leads to investment, leading to more wealth, a spiral of improvement
<b>Natural increase</b>	the difference between birth rate and death rate
<b>Net in-migration</b>	the increase in a country's population as a result of more people arriving than leaving
<b>Overpopulation</b>	a situation where the population of an area cannot be fully supported by the available resources. The symptoms include a low (even declining) standard of living, overcrowding and high unemployment.
<b>Pollution</b>	the presence of chemicals, noise, dirt or other substances which have harmful or poisonous effects on an environment
<b>Poverty</b>	a state of shortage of money and goods, usually measured in terms of average wealth and income in a society.
<b>Poverty cycle</b>	a set of processes that maintain a group or society in poverty
<b>Pre-industrial stage</b>	that period in the development of a society when manufacturing industry has yet to develop
<b>Primary employment</b>	working in the primary sector - extracting and exploiting raw materials
<b>Primary sector</b>	the economic activities that involve the working of natural resources - agriculture, fishing, forestry, mining and quarrying.
<b>Pull factor</b>	something that attracts people to a location
<b>Push factor</b>	something that makes people wish to leave a location
<b>Quality of life</b>	the degree of well-being (physical and psychological) felt by an individual or a group of people in a particular area. This can relate to their jobs, wages, food, amenities in their homes, and the services they have access to, such as schools, doctors and hospitals.



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<b>Quaternary sector</b>	the economic activities that provide intellectual services - information gathering and processing, universities, and research and development
<b>Rural-urban migration</b>	the movement of people from the countryside into towns and cities.
<b>Secondary sector</b>	the economic activities that involve making things, either by manufacturing (TV, car, etc.) or construction (a house, road, etc.). The sector also includes public utilities, such as producing electricity and gas.
<b>Sustainable development</b>	development that meets the needs of the present without compromising the (limiting) the ability of future generations to meet their own needs.
<b>Sweatshop</b>	a place of work where very poorly paid employees work long hours in unsatisfactory and often unsafe conditions
<b>Tertiary sector</b>	the economic activities that provide various services - commercial (shops and banks), professional (solicitors and dentists), social (schools and hospitals), entertainment (restaurants and cinemas) and personal (hairdressers and fitness trainers)
<b>Top-down projects</b>	projects set up and organised by governments often with little consultation with local communities
<b>Transnational company/corporation (TNC)</b>	a large company operating in several countries
<b>Urbanisation</b>	the increasing proportion / percentage of people living in towns and cities
<b>World cities</b>	the leading cities of the world, such as London, New York and Tokyo; major centres in the economic networks being produced by globalisation. They are major centres of finance, business and political influence, and are home to the headquarters of many TNCs

## 11.2: Ecosystems of the Planet

<b>Abiotic</b>	Non-living items in an ecosystem such as rocks, soil and water
<b>Biodiversity</b>	the number and variety of living species found in a specific area
<b>Biome</b>	a plant and animal community covering a large area of the Earth's surface
<b>Biotic</b>	the living parts of an ecosystem
<b>Bleaching</b>	degradation of coral reefs under conditions of increased acidity in sea water
<b>Buttress roots</b>	because the soil is not very fertile in rainforests, the taller trees have developed buttress roots. These roots give extra support for the tree, which is not able to grow deep rooting systems that such a tall tree would ordinarily grow to stabilize.
<b>Canopy</b>	the third layer of a forest formed from the lofty parts of trees. In a tropical rainforest, the canopy is made up of flat-crowned trees.
<b>Carnivore</b>	An animal that eats other animals
<b>Conservation</b>	managing the environment in order to preserve, protect or restore it
<b>Convective rainfall</b>	occurs when the energy of the sun heats the earth's surface and causes water to evaporate changing to water vapor. This warm, moist air then rises and as it rises it cools. This leads to precipitation.
<b>Coral reef</b>	a hard-stony ridge, just above or below the surface of the sea, formed by the external skeletons of millions of tiny creatures called polyps.
<b>Deforestation</b>	the chopping down and removal of trees to clear an area of forest.
<b>Ecosystem</b>	a community of plants and animals that interact with each other and their physical environment.
<b>Emergent</b>	the uppermost layer of trees in the rainforest are also known as the dominants. This fourth layer consisting of the tops of the tallest trees.
<b>Evapotranspiration</b>	the process by which water is transferred from the land to the atmosphere by evaporation from surfaces e.g. lakes, and by transpiration from plants
<b>Extinction</b>	the permanent loss of something, generally used with reference to species of plants or animals, when there are no living examples left
<b>Extreme Climate</b>	a climate that is unusually challenging, usually in terms of its temperature conditions or type and extent of precipitation.
<b>Fauna</b>	animals
<b>Flora</b>	plants
<b>Food chains</b>	the interconnections between different organisms (plants and animals) that rely upon one another as their source of food
<b>Food web</b>	an illustration of the grouping of animals and plants found in an ecosystem, showing the sources of food for each organism
<b>Fragile</b>	(environment) easily disturbed and difficult to restore therefore lacking in natural resilience. Plant communities in fragile areas have evolved in highly specialised ways to deal with challenging conditions. As a result, they cannot tolerate environmental changes.



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<b>Frontal rainfall</b>	precipitation formed when a warm (tropical) air mass rises above a denser, colder (polar) air mass. As the tropical air cools, condensation and precipitation occur.
<b>Habitat</b>	an animal or plant's natural home
<b>Herbivore</b>	an animal that eats plants
<b>Hot arid regions</b>	parts of the world that have high average temperatures and very low precipitation
<b>Humus</b>	decomposed organic matter found in the soil
<b>Interdependence</b>	the reliance of every form of life on other living things and on the natural resources in its environment, such as air, soil and water
<b>Nutrient cycle</b>	a set of processes whereby organisms extract minerals necessary for growth from soil or water, before passing them on through the food chain - and ultimately back to the soil and water.
<b>Omnivore</b>	an animal that eats both plants and animals
<b>Permafrost</b>	permanently frozen ground, found in polar (glacial and tundra) regions
<b>Polar</b>	relating to the North or South Pole. In polar regions the land is covered with ice (glacial) or frozen (tundra)
<b>Production chain</b>	the sequence of activities needed to turn raw materials into a finished product
<b>Seasonality</b>	marked differences in temperatures and/or precipitation occurring during different seasons of the year.
<b>Symbiosis</b>	the zooxanthellae are very important to the coral polyps, and the polyps are important to the zooxanthellae. The polyps give the zooxanthellae a safe place to live and food to eat. The zooxanthellae give the coral polyps Oxygen and help them make their stony shell using minerals from the sea. This kind of relationship is called Symbiosis, because both the coral polyp and the zooxanthellae get something that they need to live, and they do not harm each other
<b>Temperate climate</b>	a climate that is not extreme (in terms of heat, cold, dryness or wetness)
<b>Tundra</b>	the flat, treeless Arctic regions of Europe, Asia and North America, where the ground is permanently frozen.
<b>Understorey</b>	the forest layer below the canopy that includes small trees & young canopy trees. This is the second layer of a rainforest.
<b>Xerophytic</b>	a type of plant that can survive on very little water
<b>Zooxanthellae</b>	corals need clean, clear water to live in because there is a special kind of plant, called algae, that lives inside them. In the Florida Keys, that colour is usually gold or green, but in other parts of the world the zooxanthellae may also be other colours, like purple or pink!

## 11.3: Environmental Threats to Our Planet

<b>Climate Change</b>	long-term changes in temperature and precipitation
<b>Coriolis effect</b>	the result of Earth's rotation on weather patterns and ocean currents, making storms swirl clockwise in the southern hemisphere and anticlockwise in the northern hemisphere
<b>Drought</b>	a prolonged period of time with unusually low rainfall; droughts occur when there is not enough rainfall to support people or crops
<b>El Nino</b>	El Niño is a periodic warming of the tropical Eastern Pacific Ocean associated with a fluctuation in the low latitude pressure system known as the Southern Oscillation. This atmosphere-ocean interaction is known as ENSO, and normally occurs on timescales of between two to seven years.
<b>Enhanced Greenhouse Effect</b>	the increased greenhouse effect resulting from human action (emission of greenhouse gases) and leading to global warming
<b>Environmental pollution</b>	the degradation of the environment through the emission of toxic waste material
<b>Geological climate events</b>	climate changes that result from major geological events such as volcanic eruptions
<b>Global warming</b>	a trend in whereby global temperatures rise over time, linked in modern times with the human production of greenhouse gases.
<b>Greenhouse gases</b>	those gases in the atmosphere that absorb outgoing radiation, hence increasing the temperature of the atmosphere. Include carbon dioxide, methane and nitrous oxide.
<b>Ice age</b>	a period in the Earth's past when average global temperatures were lower and the polar ice caps were much larger than today
<b>Ice cores</b>	cylinders of ice obtained by drilling into a glacier. Since the different layers of ice are formed over time through build-up of snow, ice cores provide information on climate from different periods (up to almost one million years) that can be used for research. Measures amount of methane and/or carbon dioxide in the tiny air bubbles
<b>Inter-glacial periods</b>	historic warm periods in-between glacial periods where conditions were much the same as they are today
<b>Intertropical convergence zone (ITCZ)</b>	a low-pressure belt that encircles the globe around the Equator; it is where the trade winds from the northeast and southeast meet; the Earth is tilted on its orbit around the Sun, causing the ITCZ to migrate between the Tropics of Cancer and Capricorn with the seasons.
<b>La Nina</b>	the cold phase of ENSO leading to extensive cooling of the central and eastern Pacific.



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<b>Little Ice Age</b>	a period of slight global cooling that lasted from around the mid-fifteenth century to the mid-nineteenth century
<b>Monsoon</b>	heavy rainfall that arrives as a result of a seasonal wind, notably in southern Asia and India between May and September
<b>Orbital changes</b>	changes in the pathway of the Earth around the Sun and in its axial geometry
<b>Quaternary Period</b>	the most recent major geological period of Earth's history, consisting of the Pleistocene and the Holocene. Began 2.6 million years ago
<b>Sea-level rise</b>	the increase in the level of the sea, relative to the land
<b>Solar output</b>	the energy emitted by the Sun
<b>Tri-cellular model</b>	the tri-cellular model is made up of three different air masses which control atmospheric movements and the redistribution of heat energy. The three air masses, starting from the equator, are called the Hadley cell, Ferrel cell and the polar cell.
<b>Tropical storm (hurricane, cyclone, typhoon)</b>	an area of low pressure with winds moving in a spiral around the calm central point called the 'eye' of the storm. Winds are powerful and rainfall is heavy.
<b>Volcanic winter</b>	cooling trend caused by volcanic particles in the atmosphere blocking out the Sun's radiation
<b>Water insecurity</b>	when safe water availability is insufficient to ensure the population of an area enjoys good health, livelihood and earnings. The condition can be caused by water insufficiency or poor water quality
<b>Water insufficiency</b>	a lack of adequate water supplies needed to meet a society's economic and social needs
<b>Water unreliability</b>	when rainfall and/or river flows vary from season to season, sometimes unpredictably, resulting in periods of water scarcity.