Year 9: Unit 1
Prisoners of Geography

Key Words

Prisoners of geography	When a country struggles to develop due to problems caused by physical geography.
Development Gap	The difference in quality of life between different countries.
Physical Geography	Anything natural such as rainforests, deserts, oceans, climate or natural hazards.
Ecosystems	A natural place made up of plants and animals.
Superpower	A large country that has a large population, strong economy, military power and influence over others.
Natural Resources	Materials from the land that are useful such as oil and coal.
Trade Routes	The journey cargo ships take to transport goods from one country to another.

THE CHANGING ARCTIC

The Arctic is the most northern part of the planet. It is an ice sheet that covers the top (containing the North Pole).

- Temperatures can be as low as -50°C.
- For 6 months of the year it is in darkness.
- The Arctic Ocean freezes for 4 months of the year.
- There are some small populations.

How is it changing?

The Arctic ice sheet is shrinking due to climate change. There are some predictions that suggest it could be completely gone by 2040!



SHOULD WE MINE THE ARCTIC?

Yes we should!	No we shouldn't!
• Oil and natural gas are very useful . • We are running out of them – oil could be gone in 50 years. • Renewable energy is unreliable.	• Very dangerous • Expensive to run pipelines. • Damage ecosystems. • Melting ice would contribute more to global warming. • Conflict could occur over who has ownership.

WHERE IS RUSSIA?

Russia is the largest country in the world. It sits with part of it in Asia and part in Europe – this division is made by the Ural Mountains.



RUSSIA'S PHYSICAL GEOGRAPHY

Russia has 5 main ecosystems covering it:

- **Desert (south)** – a dry and arid ecosystem.
- **Steppes (west)** – dry grassy plain with cold winters and warm summers.
- **Coniferous forest (north west)** – Short summer and mild climate.
- **Taiga (central, south & east)** – Short, wet summers and long cold winters.
- **Tundra (north)** – snowy and mountainous.

WHY IS THE ARCTIC ECONOMICALLY VALUABLE?

- **Trade Routes –** Cargo ships can travel through the Arctic through the Northwest Passage for several weeks in the summer. This route is deeper and 40% shorter than passing through the Panama Canal.
- **Natural Resources –** The melting ice has revealed vast quantities of oil and natural gas. Estimated 90 billion barrels of oil. There are also reserves of gold, nickel, zinc and iron.

COULD RUSSIA BE A FUTURE SUPERPOWER?

Yes it could!!	No it won't!!
• Second largest supply of gas and oil. • Use oil and gas politically and give cheaper prices to countries who work with it. • Threaten countries to turn off their energy supply. • Building an Arctic Army giving control over northern waters. • Trying to claim the Arctic with its continental shelf.	• Many countries are moving towards renewables to reduce their reliance on oil and gas. • Due to Russia's aggression many countries will not want to work with it. • Countries are trying to reduce their reliance on Russia's oil supply so they don't have as much power.

RUSSIA'S HISTOY

1900s-1918 The Russian Empire	Russia has a royal family and the head of the Russian Empire was the Tsar. This was when Russia was the largest and had take over countries known today as Ukraine, Belarus and Finland etc. This ended after the Russian Revolution.
1900s (post 1918) USSR (Soviet Russia)	During WW2 Russia was one of the 5 most powerful countries in the world. It was now ran by dictator, Joseph Stalin. Russia was known as the USSR and had lost some countries such as Finland. Russia also had lots on technological advancements in the era and was vital in the Space Race.
Post 1991 Russia today	After the fall of the USSR, Russia lost more countries such as Ukraine. Russia today is no longer grouped with superpowers like the USA. It is now grouped with the 'BRICs" (Brazil India and China – countries that are classed as NEES.)

RUSSIA – A PRISONER OF ITS PHYSICAL GEOGRAPHY?

Ural Mountains	Divide Russia in 2 meaning the west is well developed but the east isn't as the wealth couldn't travel.
Little access to a warm water port.	Landlocked in the south meaning it can't trade easily and would face conflict in South Asia.
Northern ports freeze for 4 months.	Can't trade from its northern ports for 4 months of the year meaning it loses money and influence.
Taiga ecosystem	Can be very cold and mountainous meaning travel is difficult and people cannot live here limiting development.

PUTIN'S OBSESSION WITH UKRAINE AND CRIMEA

Where is Ukraine and Crimea?

Ukraine is in Eastern Europe. It borders Poland, Belarus, Romania and Russia. It used to be part of the Russian Empire and the USSR but was given independence after its collapse. Crimea is to the south of the Ukraine and was given to Ukraine in the USSR.



Ukraine's political situation

NATO and the EU

Ukraine was to join these organisations as they promote democracy and would back them up if there was conflict. However, they have not been accepted at present due to closeness to Russia.

RUSSIA

Russia don't want Ukraine to join as it would reduce their power. They threatened to turn off Ukraine's power if they joined the EU. In the east and south there are many Pro-Russian people who want to be part of Russia again leading to conflict.

Why does Putin want Ukraine and Crimea?

It would give Russia better military control over the Black Sea. They have a port in Crimea but have to pay a lease to Ukraine. It would also give Russia better access to Europe.

'Undeclared war' – In 2014 Russia seized Crimea and it is not under their control. This has promoted Pro-Russia uprisings in South Ukraine. Europe and the US did little to help as they get energy from Russia.

Year 9: Unit 1
Prisoners of Geography

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Prisoners of geography	When a country struggles to develop due to problems caused by physical geography.
Physical geography	Anything natural such as rainforests, deserts, oceans, climate or natural hazards.
Colonisation	When European countries conquered other countries and created colonies that they ran and had control over.
Corruption	When a government is corrupt they will keep money for themselves and not use it to help residents of their country.
Landlocked	When a country is surrounded by other countries and has no access to the sea.
Powerhouse	A country that has a lot of money, power or influence in a certain area.
Technology	Modern inventions such a planes that help us overcome physical geography.

AFRICA – A SERIOUS PRISONER OF GEOGRAPHY

Africa should be the most developed continent as it was where the first humans lived.
However, it has been very unlucky it its physical geography. It seems to have several natural advantages, however...



Lots of rivers	But they don't connect and are full of waterfalls.
Plenty of coastline	Leaving it isolated from Europe and Asia.
Lovely beaches	No natural harbours for ports meaning they couldn't trade.
Sahara Desert barrier	Stopped trade with Europe and Asia.
Congo Rainforest full of resources	Created a barrier in the middle of the country to trade and stopped movement around the country.
Second biggest continent	Created 140 languages = communication is hard.
Warm climate	Diseases such as malaria and yellow fever spread.

So populations were crowded and diseases spread!

THE USA AND MEXICO

The USA and Mexico are 2 countries in North America. They are neighbours but have very different lives. The USA is the 15th most developed country whereas Mexico is the 76th. Mexico has 4 times more people living in poverty than the USA.



CAN WE OVERCOME PHYSICAL GEOGRAPHY?

- **Internet** – better communication and TNCs can locate in LICs and NEEs.
- **Aeroplanes** – Trading goods for landlocked countries is easier.
- **Better transport** – Bigger ships mean more can be transported. Factories can be located all around the world.

Refrigeration – Food can be traded and imported without it going stale.
Managing natural disasters – we can respond and prepare for natural disasters much more effectively.
Industry diversification – Countries don't have to be reliant on natural resources.
HICs supporting LICs – HICs have started to help LICs. EG. Fair Trade schemes.

THE PROBLEM OF THE DEMOCRATIC REPUBLIC OF THE CONGO (DRC)

The DRC has been blessed and cursed with its physical geography.

Colonisation & The DRC's borders	The Europeans drew straight borders on Africa without thinking about its physical geography. These borders made the DRC a weak and divided state with the rainforest in the centre. It is basically landlocked except for a 25 mile coast in the Atlantic.
Belgium's colonial rule	Belgium took loads of the DRC's resources and built little infrastructure to help the local people.
Mobutu's dictatorship	Mobutu lined his own pockets and left the DRC to crumble. It broke up into city states as road links and telephone systems were not maintained.
African World Wars	The DRC has 9 neighbours. All these countries try to invade and take its resources. Due to the government been so weak it can't fight back. Wars have been constant – tens of thousands have died from war and further 6 million from poverty.

USA – A SUPERPOWER

The USA won the physical geography lottery for a variety of reasons:

Natural harbours and fertile soils	The coastline provided lots of places for ships to dock and the land meant food could be easily grown.
The Appalachian Mountains	The mountains provided a barrier to stop attacks from the west while settlements developed.
Freedom from the British	The Declaration of Independence was signed in 1776 which meant they were freed of British rule.
The Mississippi River	The Mississippi provided great inland transport and gave access to the Gulf of Mexico increasing trade.
Alaska	Major gold and oil deposits were found in Alaska.
World War II	The British gave the USA all of their naval bases in the W. hemisphere in exchange for help in WW2.
Natural Resources	Massive reserves of oil and natural gas meaning the USA could be self sufficient.

MEXICO – A COUNTRY FULL OF PROBLEMS!

Physical Problems

- Desert in the north forms a barrier between Mexico and the USA.
- Mountains to the east and west make it more difficult for Mexico to access the coastline.
- Rainforest in the south in uninhabitable and would make it difficult for Mexico to expand to the south.

Human Problems

- **Weak and undemocratic government** – the government struggle to control the territory and relies on the US to keep trade open in the Gulf of Mexico.
- **Drug cartels** – Drug cartels are better armed than the government and provide jobs. They maintain control through violence and fear.

TRUMP'S WALL

PRO- WALL:
- Stop illegal immigration and drug smuggling.

ANTI- WALL:
- Trump is seen as racist.
- Money would be better spent helping poverty in the south = stop drug employment

AFRICA'S CURRENT POWERHOUSES

NIGERIA
Richest country in Africa. Largest oil exporter. Home to Nollywood.

SOUTH AFRICA
Only country to not have malaria. Gold and silver reserves. Lots of fertile land.

AFRICA'S POTENTIAL FUTURE POWERHOUSES

Egypt	Contains the R. Nile. Most powerful military. Guards the Suez Canal.
Ethiopia	20 dams for hydroelectric power. Has a large supply of fresh water.
Angola	2nd largest oil producer. Has a rainforest and desert barrier.
Kenya	Oil reserves. Large scale rail project to increase trade from Nairobi.
Tanzania	Planned biggest African port. Good transport with Southern Africa.

Year 9: Unit 2
Ecosystems



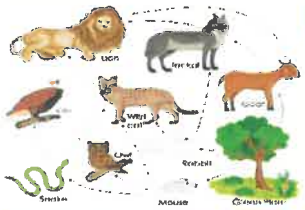


What is an Ecosystem?

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 and rock.
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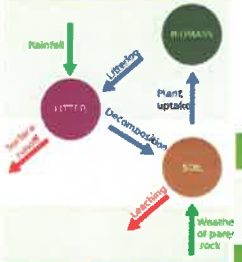


Food Web and Chains

Simple food chains are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. Food webs however consists of a network of many food chains interconnected together.

Nutrient cycle

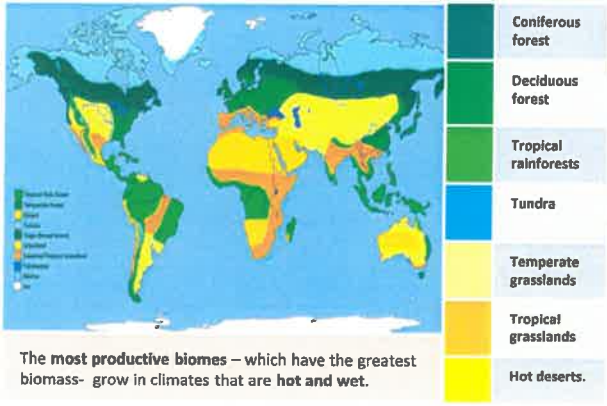
Plants take in nutrients to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by decomposers.



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.



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

Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
Tropical 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.
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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.

Tropical Rainforest Biome

Tropical rainforest cover about 2 per cent of the Earth's surface yet they are home to over half of the world's plant and animals.

Interdependence in the rainforest

A rainforest works through interdependence. This is where the plants and animals depend on each other for survival. If one component changes, there can be serious knock-up effects for the entire ecosystem.



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.

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 showers.
- At night with no clouds insulating, temperature drops.

CASE STUDY: UK Ecosystem: Epping Forest, Essex

This is a typical English lowland deciduous woodland. 70% of the area is designated as a Site of Special Scientific Interest (SSI) for its biological interest, with 66 % designated as a Special Area of Conservation (SAC).

Components & Interrelationships	
Spring	Flowering plants (producers) such as bluebells store nutrients to be eaten by consumers later.
Summer	Broad tree leaves grow quickly to maximise photosynthesis.
Autumn	Trees shed leaves to conserve energy due to sunlight hours decreasing.
Winter	Bacteria decompose the leaf litter, releasing the nutrients into the soil.

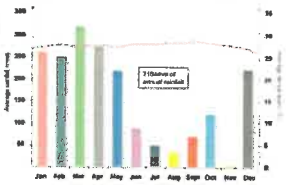
Management

- Epping has been managed for centuries.
- Currently now used for recreation and conservation.
- Visitors pick fruit and berries, helping to disperse seeds.
- Trees cut down to encourage new growth for timber.



Layers of the Rainforest

Emergent	Highest layer with trees reaching 50 metres.
Canopy	Most life is found here as it receives 70% of the sunlight and 80% of the life.
Understorey	Consists of trees that reach 20 metres high.
Forest floor	Lowest layer with small trees that have adapted to living in the shade.



Tropical Rainforests: Case Study Malaysia

Malaysia is a LIC country is south-east Asia. 67% of Malaysia is a tropical rainforest with 18% of it not being interfered with. However , Malaysia has the fastest rate of deforestation compared to anywhere in the world

Adaptations to the rainforest

Orangutans	Large arms to swing & support in the tree canopy.
Drip Tips	Allows heavy rain to run off leaves easily.
Lianas & Vines	Climbs trees to reach sunlight at canopy.

Rainforest inhabitants

Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with...

- Food through hunting and gathering.
- Natural medicines from forest plants.
- Homes and boats from forest wood.

Issues related to biodiversity

Why are there high rates of biodiversity?

- Warm and wet climate encourages a wide range of vegetation to grow.
- There is rapid recycling of nutrients to speed plant growth.
- Most of the rainforest is untouched.

Main issues with biodiversity decline

- Keystone species (a species that are important of other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components.
- Decline in species could cause tribes being unable to survive.
- Plants & animals may become extinct.
- Key medical plants may become extinct.

Impacts of deforestation

Economic development

+ Mining, farming and logging creates employment and tax income for government.
+ Products such as palm oil provide valuable income for countries.
- The loss of biodiversity will reduce tourism.

Soil erosion

- Once the land is exposed by deforestation, the soil is more vulnerable to rain.
- With no roots to bind soil together, soil can easily wash away.

Climate Change

-When rainforests are cut down, the climate becomes drier.
-Trees are carbon 'sinks'. With greater deforestation comes more greenhouse emissions in the atmosphere.
-When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect.

What are the causes of deforestation?

Logging

- Most widely reported cause of destructions to biodiversity.
- Timber is harvested to create commercial items such as furniture and paper.
- Violent confrontation between indigenous tribes and logging companies.

Agriculture

- Large scale 'slash and burn' of land for ranches and palm oil.
- Increases carbon emission.
- River saltation and soil erosion increasing due to the large areas of exposed land.
- Increase in palm oil is making the soil infertile.

Mineral Extraction

- Precious metals are found in the rainforest.
- Areas mined can experience soil and water contamination.
- Indigenous people are becoming displaced from their land due to roads being built to transport products.

Tourism

- Mass tourism is resulting in the building of hotels in extremely vulnerable areas.
- Lead to negative relationship between the government and indigenous tribes
- Tourism has exposed animals to human diseases.

Energy Development

- The high rainfall creates ideal conditions for hydro-electric power (HEP).
- The Bakun Dam in Malaysia is key for creating energy in this developing country, however, both people and environment have suffered.

Road Building

- Roads are needed to bring supplies and provide access to new mining areas, settlements and energy projects.
- In Malaysia, logging companies use an extensive network of roads for heavy machinery and to transport wood.

Sustainability for the Rainforest

Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change.

Possible strategies include:

- **Agro-forestry** - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients.
- **Selective logging** - Trees are only felled when they reach a particular height.
- **Education** - Ensuring those people understand the consequences of deforestation
- **Afforestation** - If trees are cut down, they are replaced.
- Forest reserves - Areas protected from exploitation.
- Ecotourism - tourism that promotes the environments & conservation

Hot Desert: Case Study Thar Desert – India/Pakistan

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

Distribution of the world's hot deserts

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



Major characteristics of hot deserts

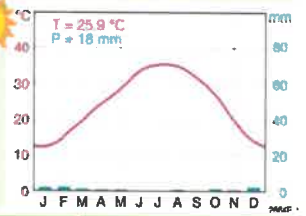
- Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm.
- Heat – hot deserts rise over 40 degrees.
- Landscapes – Some places have dunes, but most are rocky with thorny bushes.

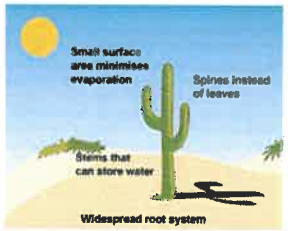
Hot Deserts inhabitants

- People often live in large open tents to keep cool.
- Food is often cooked slowly in the warm sandy soil.
- Head scarves are worn by men to provide protection from the Sun.

Climate of Hot Deserts

- Very little rainfall with less than 250 mm per year.
- It might only rain once every two to three years.
- Temperate are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C).
- In winter, deserts can sometimes receive occasional frost and snow.





Adaptations to the desert

Cactus	• Large roots to absorb water soon after rainfall. • Needles instead of leaves to reduce surface area and therefore transpiration.
Camels	• Hump for storing fat (NOT water). • Wide feet for walking on sand. • Long eyelashes to protect from sand.



Desert Interdependence

Different parts of the hot desert ecosystem are closely linked together and depend on each other, especially in a such a harsh environment.

Opportunities and challenges in the Hot desert

Opportunities

- There are valuable minerals for industries and construction.
- Energy resources such as coal and oil can be found in the Thar desert. Great opportunities for renewable energy such as solar power at Bhaleri.
- Thar desert has attracted tourists, especially during festivals.
- The Ghandi Canal provides irrigation for cotton farms.

Challenges

- The extreme heat makes it difficult to work outside for very long.
- High evaporation rates from irrigation canals and farmland.
- Water supplies are limited, creating problems for the increasing number of people moving into area.
- Access through the desert is tricky as roads are difficult to build and maintain.

Causes of Desertification

Desertification means the turning of semi-arid areas (or drylands) into deserts.

Climate Change
Reduce rainfall and rising temperatures have meant less water for plants.

Fuel Wood
People rely on wood for fuel. This removal of trees causes the soil to be exposed.

Overgrazing
Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.

Over-Cultivation
If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.

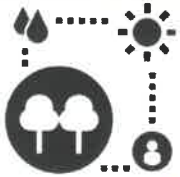
Population Growth
A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.

Strategies to reduce Desertification in the Machakos region, Kenya:

Terracing- Turning the sides of the hills into steps to stop water washing the soil away.
Tree Planting - trees can act as windbreakers to protect the soil from wind and soil erosion.
Soil Management - leaving areas of land to rest and recover lost nutrients.
Technology – using less expensive, sustainable materials for people to maintain. Magic stones were used on the fields to slow down the flow of water and trap it.

Year 9: Unit 3
Ecosystems





What is an Ecosystem?

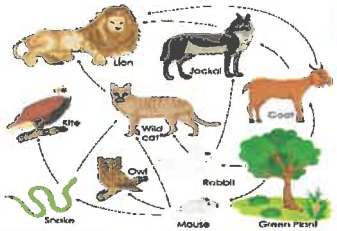
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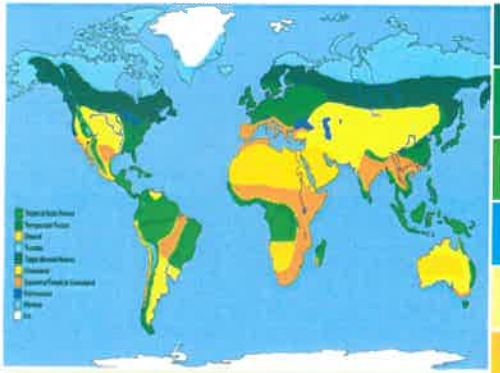


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Biomes

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

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A rainforest works through interdependence. This is where the plants and animals depend on each other for survival. If one component changes, there can be serious knock-up effects for the entire ecosystem.



Distribution of Tropical Rainforests

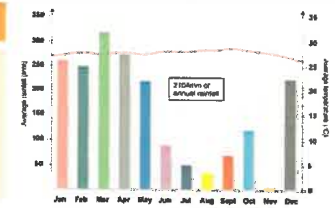
Tropical rainforests are centred along the Equator between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. The Amazon is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as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

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 showers.
- At night with no clouds insulating, temperature drops.

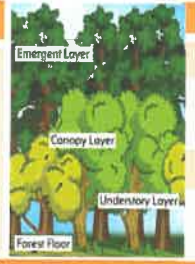


CASE STUDY: UK Ecosystem: Epping Forest, Essex

This is a typical English lowland deciduous woodland. 70% of the area is designated as a Site of Special Scientific Interest (SSI) for its biological interest, with 66 % designated as a Special Area of Conservation (SAC).

Components & Interrelationships		Management
Spring	Flowering plants (producers) such as bluebells store nutrients to be eaten by consumers later.	- Epping has been managed for centuries. - Currently now used for recreation and conservation. - Visitors pick fruit and berries, helping to disperse seeds. - Trees cut down to encourage new growth for timber.
Summer	Broad tree leaves grow quickly to maximise photosynthesis.	
Autumn	Trees shed leaves to conserve energy due to sunlight hours decreasing.	
Winter	Bacteria decompose the leaf litter, releasing the nutrients into the soil.	

Layers of the Rainforest



Emergent	Highest layer with trees reaching 50 metres.
Canopy	Most life is found here as it receives 70% of the sunlight and 80% of the life.
Understorey	Consists of trees that reach 20 metres high.
Forest floor	Lowest layer with small trees that have adapted to living in the shade.

Tropical Rainforests: Case Study Malaysia

Malaysia is a LIC country is south-east Asia. 67% of Malaysia is a tropical rainforest with 18% of it not being interfered with. However , Malaysia has the fastest rate of deforestation compared to anywhere in the world

Adaptations to the rainforest

Orangutans	Large arms to swing & support in the tree canopy.
Drip Tips	Allows heavy rain to run off leaves easily.
Lianas & Vines	Climbs trees to reach sunlight at canopy.

Rainforest inhabitants

Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with...

- Food through hunting and gathering.
- Natural medicines from forest plants.
- Homes and boats from forest wood.

Issues related to biodiversity

Why are there high rates of biodiversity?

- Warm and wet climate encourages a wide range of vegetation to grow.
- There is rapid recycling of nutrients to speed plant growth.
- Most of the rainforest is untouched.

Main issues with biodiversity decline

- Keystone species (a species that are important of other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components.
- Decline in species could cause tribes being unable to survive.
- Plants & animals may become extinct.
- Key medical plants may become extinct.

Impacts of deforestation

Economic development

+ Mining, farming and logging creates employment and tax income for government.
+ Products such as palm oil provide valuable income for countries.
- The loss of biodiversity will reduce tourism.

Soil erosion

- Once the land is exposed by deforestation, the soil is more vulnerable to rain.
- With no roots to bind soil together, soil can easily wash away.

Climate Change

-When rainforests are cut down, the climate becomes drier.
-Trees are carbon 'sinks'. With greater deforestation comes more greenhouse emissions in the atmosphere.
-When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect.

What are the causes of deforestation?

Logging

- Most widely reported cause of destructions to biodiversity.
- Timber is harvested to create commercial items such as furniture and paper.
- Violent confrontation between indigenous tribes and logging companies.

Agriculture

- Large scale 'slash and burn' of land for ranches and palm oil.
- Increases carbon emission.
- River saltation and soil erosion increasing due to the large areas of exposed land.
- Increase in palm oil is making the soil infertile.

Mineral Extraction

- Precious metals are found in the rainforest.
- Areas mined can experience soil and water contamination.
- Indigenous people are becoming displaced from their land due to roads being built to transport products.

Tourism

- Mass tourism is resulting in the building of hotels in extremely vulnerable areas.
- Lead to negative relationship between the government and indigenous tribes
- Tourism has exposed animals to human diseases.

Energy Development

- The high rainfall creates ideal conditions for hydro-electric power (HEP).
- The Bakun Dam in Malaysia is key for creating energy in this developing country, however, both people and environment have suffered.

Road Building

- Roads are needed to bring supplies and provide access to new mining areas, settlements and energy projects.
- In Malaysia, logging companies use an extensive network of roads for heavy machinery and to transport wood.

Sustainability for the Rainforest

Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change.

Possible strategies include:

- **Agro-forestry** - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients.
- **Selective logging** - Trees are only felled when they reach a particular height.
- **Education** - Ensuring those people understand the consequences of deforestation
- **Afforestation** - If trees are cut down, they are replaced.
- Forest reserves - Areas protected from exploitation.
- Ecotourism - tourism that promotes the environments & conservation

Hot Desert: Case Study Thar Desert – India/Pakistan

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

Distribution of the world's hot deserts

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



Major characteristics of hot deserts

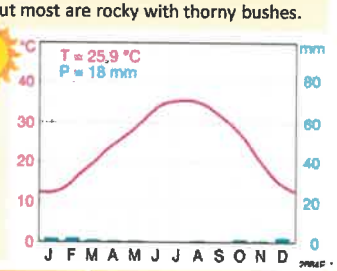
- Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm.
- Heat – hot deserts rise over 40 degrees.
- Landscapes – Some places have dunes, but most are rocky with thorny bushes.

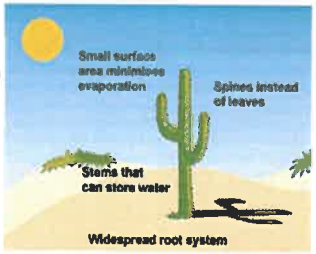
Hot Deserts inhabitants

- People often live in large open tents to keep cool.
- Food is often cooked slowly in the warm sandy soil.
- Head scarves are worn by men to provide protection from the Sun.

Climate of Hot Deserts

- Very little rainfall with less than 250 mm per year.
- It might only rain once every two to three years.
- Temperate are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C).
- In winter, deserts can sometimes receive occasional frost and snow.





Adaptations to the desert

Cactus	• Large roots to absorb water soon after rainfall. • Needles instead of leaves to reduce surface area and therefore transpiration.
Camels	• Hump for storing fat (NOT water). • Wide feet for walking on sand. • Long eyelashes to protect from sand.



Desert Interdependence

Different parts of the hot desert ecosystem are closely linked together and depend on each other, especially in a such a harsh environment.

Opportunities and challenges in the Hot desert

Opportunities

- There are valuable minerals for industries and construction.
- Energy resources such as coal and oil can be found in the Thar desert. Great opportunities for renewable energy such as solar power at Bhaleri.
- Thar desert has attracted tourists, especially during festivals.
- The Ghandi Canal provides irrigation for cotton farms.

Challenges

- The extreme heat makes it difficult to work outside for very long.
- High evaporation rates from irrigation canals and farmland.
- Water supplies are limited, creating problems for the increasing number of people moving into area.
- Access through the desert is tricky as roads are difficult to build and maintain.

Causes of Desertification

Desertification means the turning of semi-arid areas (or drylands) into deserts.

Climate Change
Reduce rainfall and rising temperatures have meant less water for plants.

Fuel Wood
People rely on wood for fuel. This removal of trees causes the soil to be exposed.

Overgrazing
Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.

Over-Cultivation
If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.

Population Growth
A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.

Strategies to reduce Desertification in the Machakos region, Kenya:

Terracing- Turning the sides of the hills into steps to stop water washing the soil away.
Tree Planting - trees can act as windbreakers to protect the soil from wind and soil erosion.
Soil Management - leaving areas of land to rest and recover lost nutrients.
Technology – using less expensive, sustainable materials for people to maintain. Magic stones were used on the fields to slow down the flow of water and trap it.

Key Words

Global	Connected to the whole world
Regional	A local area or part of a country. In this unit we refer to Africa as a region.
Low Income Country	A poorer country with low GDP per capita.
Newly Emerging Economy	Newly Emerging Economies are those countries that are becoming richer at a fast rate
Economic	To do with money
Aid	Money or resources given to a country in need.
TNCs	Trans-National Corporations are companies that operate in a number of countries.

Nigeria's Economy is improving due to a variety of factors.

Growth in manufacturing: such as leather items and textiles.

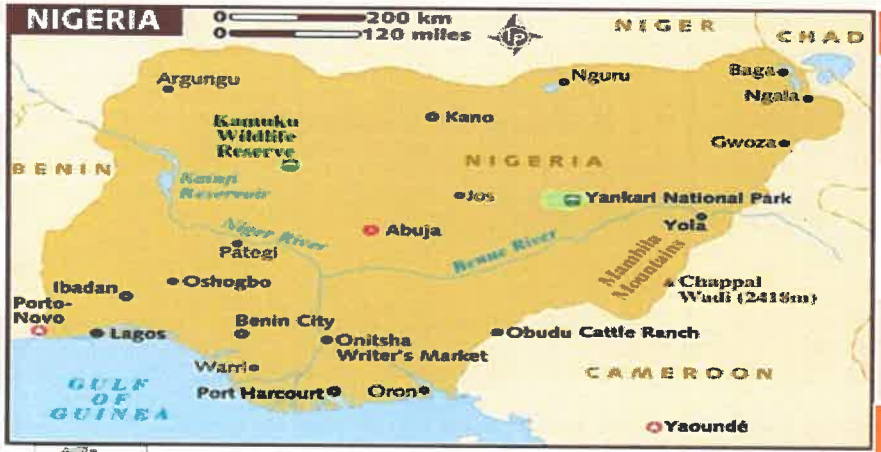


- Regular paid work enables people to spend money on buying products and homes.
- More people are employed which means more taxes are generated.
- Encourages foreign investment.

Stable Government 	Encourages foreign investment. Spend incomes wisely and not keep the money.
Many people speak English	Encourages foreign investment. Easier to operate business.
Increased use of telecommunication	Encourages foreign investment. This is beginning to drive the economy rather than oil.

Where is Nigeria?

Nigeria is located in the west of Africa. It is Africa's richest country and is leading the way for Africa's development. It is Africa's powerhouse.





Year 9: Unit 4
Nigeria: A Case Study



Types of Aid

Emergency Aid: This usually follows natural disasters, war or conflict. Aid may take the form of food, water or medical supplies.

Development Aid: This is long term support given by charities or governments. It aims to improve quality of life by providing safe water, education or improvements to infrastructure.



Advantages of aid in Nigeria

The Aduwan Health Centre

With support form the charity Action Aid a new clinic was built on 2010. The new clinic:

- Trains local women to educate mothers about immunising their children against deadly diseases.
- Tests for infections
- Immunises children



Problems with aid in Nigeria

- Corruption in the government, and by individuals, is a major fact in the loss of aid.
- The government may use the money for other things such as building up the Navy.
- Donors may have political influences over what happens to aid.
- The government will keep the money for themselves instead of using it to invest in things that will improve life for the people.
- A country may become too reliant on aid.

The importance of Nigeria

Nigeria's economy is growing rapidly and it is quickly becoming a country of both **regional and global** importance.



Global	Regional
In 2014 Nigeria became the world's 21st largest economy – by 2050 it should be in the top twenty.	Nigeria has one of the fastest growing economies in Africa – it has the 3rd largest GDP of the continent.
Nigeria supplies 2.7% of the world's oil – it is the 12th largest producer.	Nigeria has the highest farming output in Africa despite many issues – 70% of people are employed in agriculture.
Many TNCs such as Wal-Mart (American ASDA), Microsoft of Oracle are operating in Nigeria	Nigeria has developed a diverse economy with financial services, telecommunications and the media.

TNCs: The good and the bad

Companies like Shell Oil provide employment and the development of new skills.	Working conditions are often very poor.
Local companies benefit from increased orders.	Much of the profit generated goes abroad.
TNCs like Shell invest in infrastructure and education.	Management jobs tens to go to foreign employees.
Valuable export revenues are created.	Grants used to attract TNCs to a LIC/NEE could have been used on local projects.

The Problems of Economic Growth

Industrial Growth: Nigeria has about 5000 registered industries and about 10000 illegal small scale industries. This has grown quickly and are largely unregulated, they have led to several environmental problems.



Urban Growth: As Nigeria has developed, urban areas have grown rapidly and has been unregulated. This rate of urbanisation has caused environmental problems.



Commercial Farming: Commercial farming has increased rapidly in Nigeria. Traditional farming techniques have changed in order to cope with the increased population and lack of space.



Year 9: Unit 4

Lagos: A Case Study

Living in Lagos - The Onososu Dump

Positives – A place of smiles	Nothing is wasted, locals recycle almost everything. There is money to be made in this industry. The dump provides over 5000 jobs There is an huge sense of community and pride in the area.
Challenges – A place of suffering.	Vey few people become wealthy, they mainly earn just enough to live on. Poor living conditions and poor sanitation. Daily power cuts.

Living in Lagos - Challenges in the Mokoko Slums

Social 	Poor living conditions in slums **Lack of sanitation.** There are communal toilets, but they need to be shared by around 15 households. Currently, **malaria,** respiratory diseases and malnutrition are endemic problems in Makoko.
Economic 	**Many people have poor jobs,** many of the jobs are in the informal sector. There are no health and safety guidelines, no sick pay, no holiday pay etc.
Environmental 	**Lack of access to clean water** – there are few water pipes in the slum and those that exist only have the supply switched on for 2 hours a day. Air and water pollution.

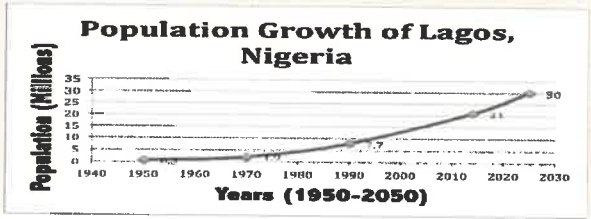
The Location of Lagos

Lagos is Nigeria's largest city. It lies in the South West of the country on the coast of the Gulf of Guinea close to Nigeria's border with Benin.



Growing Population –WHY?

- An estimated 2,000 people enter Lagos every day in search of a better quality of life. Lagos is seen as the city of opportunities. Many of these internal migrants end up in informal settlements like Makoko.
- There is also a natural population increase, in other words, the death rate is lower than the birth rate
- There are better employment opportunities with higher pay and of a wider range in Lagos than in many other parts of Nigeria.
- In Nigeria the health care facilities in rural areas are very poor, overcrowded or difficult to access.
- People in Lagos have better access to electricity than in rural areas.
- The ability to provide children with a better education is a massive pull factor to Lagos.



The importance of Lagos

Lagos' economy is growing rapidly and it is quickly becoming a country of both **regional and global** importance.

Global	Regional
As Lagos is on the Atlantic coastline of Nigeria allowing for excellent trade routes.	With more schools and universities the workforce is becoming better skilled and educated.
Murtala Muhammed International Airport has also increased the accessibility of Lagos. It is now the main arrival point for 80% of flights to West Africa.	The growing population provides as workforce for goods and services along with a market for them
A 2015 report by the Economist states that annually Lagos State generates $90 billion dollars in goods and services.	The majority of Nigeria's manufacturing is based in Lagos as well as many service industries such as finance.

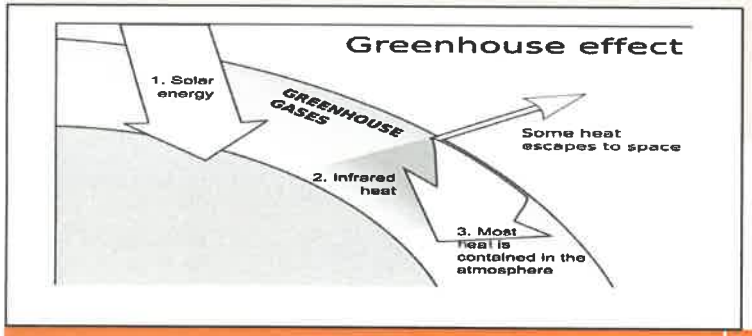
Improving Lagos

Issue		Solutions	Challenges
Traffic 	Lagos is one of the most **congested cities in the world.** 40 per cent of cars in Nigeria are registered in Lagos. Commuters spend at least **three hours in traffic each day.** Traffic congestion leads to many problems for the residents of Lagos.	The New Transport Plan for Lagos includes:- **a waterway network** of ferries making use of the water around Lagos; a road network with **separate bus lanes; a new airport** further away from the urban environment.	By just improving transport links between residential suburbs and downtown, the government is missing the point. New cities have to be planned and built so **people can work near their homes and avoid commuting. More people will migrate to Lagos!**
Poverty 	<u>Overpopualtion</u> is a major factor in the growing number living below the poverty line. Also referred to as the city that won't stop growing, Lagos does not have sufficient economic opportunities for the thousands of people who relocate there weekly. There is a shortage of jobs and housing.	**The Eko Development** is expected to provide accommodation for 250,000 people and employment opportunities for a further 150,000. Slum improvements; floating school, extra classrooms, improved water access.	**The Eko Atlantic Development** is a huge project aimed not at the urban poor but at the wealthy and is a mixed use residential and business development, along its upmarket Bar Beach coastline.

Climate Change is Caused by the Ozone Layer

The Earth's average temperature is about **15C** but has been much higher and lower in the past. There are natural fluctuations in the climate but scientists say temperatures are now rising faster than at many other times.

This is linked to the **greenhouse effect** which describes how the Earth's atmosphere **traps some of the Sun's energy.** Solar energy radiating back to space from the Earth's surface is absorbed by greenhouse gases and re-emitted in all directions. This heats both the lower atmosphere and the surface of the planet. **Without this effect, the Earth would be about 30C colder and hostile to life.** Scientists believe we are adding to the natural greenhouse effect, with gases released from industry and agriculture trapping more energy and increasing the temperature.
This is known as climate change or global warming.



What is the Ozone Layer?

In May **1985** scientists with the British Antarctic Survey shocked the world when they announced the **discovery of a huge hole in the ozone layer over Antarctica**. This allows UV-B rays than can cause **skin cancer** and cataracts in humans, as well as reproductive problems in fish, crabs, frogs, and even in the single-celled phytoplankton at the bottom of the ocean food chain.

A pact to **phase out the use of CFCs** and restore the ozone layer was eventually signed by every country in the United Nations—the first UN treaty to achieve universal ratification. **Now a complete rebound seems imminent. Some scientists project that by 2080 global ozone will return to 1950s levels.**

THIS IS NOTHING TO DO WITH THE GREENHOUSE EFFECT AND THEREFORE NOTING TO DO WITH CLIMATE CHANGE.



Sustainability is Just About Climate Change

Causing as little damage to the planet as possible and using as few natural resources as possible.

- ✓ Preserving the environment as much as possible. Renewable energy resources.
- ✓ Reducing the pressure on natural resources – food, fossil fuels, trees.
- ✓ Eco-friendly – minimising pollution.
- ✓ Reduce, reuse, recycle.

Sustainable societies can't just focus on **environmental** issues, to be truly sustainable a society has to consider **social and economic** issues. **Sustainability is meeting the needs of the present generation without compromising the needs of future generations.**

Curitiba in Brazil has addressed all of these issues and is regarded as a sustainable city.

Year 9: Unit 5

Geographical Misconceptions



Curitiba Sustainability

Social		People in the slums collected **rubbish for recycling**, and the council **paid for the weight** collected using fruit and vegetables.
Environmental		There are **28 parks** and wooded areas in Curitiba, creating a city landscape which is unlike any other in a developing city.
Economic		The industrial city in Curitiba is home to many **transnational industries,** such as Nissan.

Greenland is the Same Size as Africa



The Mercator Projection



The world as we know it, or at least the way we view it on a map, is wrong.

Astoundingly, we've been viewing things incorrectly since 1569. That's when Flemish cartographer Gerardus Mercator designed the **"Mercator Projection,"** to help sailors navigate the seas. His creation was widely praised, thanks to its clean, straight lines for latitude and longitude and the way it preserved the relative shape of each country and continent.

Today, the Mercator Projection is still widely used in schools, and is even the source for Google Maps. **Yet there's a lot about this map, and others, that is inaccurate.**

One of the biggest map blunders is Greenland, which looks larger than the entire continent of South America and comparable to Africa.
In reality, Greenland wouldn't even cover Argentina or Algeria.
South America is more than 8 times its size, while Africa is an astounding 14 times larger than Greenland.

Key Words

Greenhouse Effect	The greenhouse effect is the process by which radiation from a planet's atmosphere warms the planet's surface to a temperature above what it would be without this atmosphere.
Sustainability	Sustainability is meeting the needs of the present generation without compromising the needs of future generations. Sustainability can be environmental, social and economic.
Ozone Layer	The **ozone layer** is a thin part of the Earth's atmosphere that absorbs almost all of the sun's harmful ultraviolet light. "**Ozone** holes" are popular names for areas of damage to the **ozone layer**.

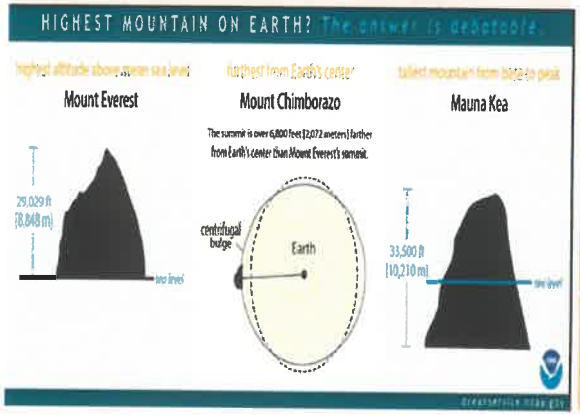
Mt Everest is the Tallest Mountain

A mountain is a large **landform** that rises above the surrounding land in a limited area, usually in the form of a peak. A mountain is generally considered to be steeper than a hill. Mountains are formed through **tectonic forces** or volcanism. These forces can locally raise the surface of the earth. Mountains **erode** slowly through the action of rivers, weather conditions, and glaciers. A few mountains are isolated summits, but most occur in huge **mountain ranges.**

The highest mountain on Earth is **Mount Everest in the Himalayas of Asia**, whose summit is **8,850 m** (29,035 ft) above mean sea level. Everest is indeed the highest point above global mean sea level—the average level for the ocean surface from which elevations are measured. But the summit of Mt. Everest is not the farthest point from Earth's centre.

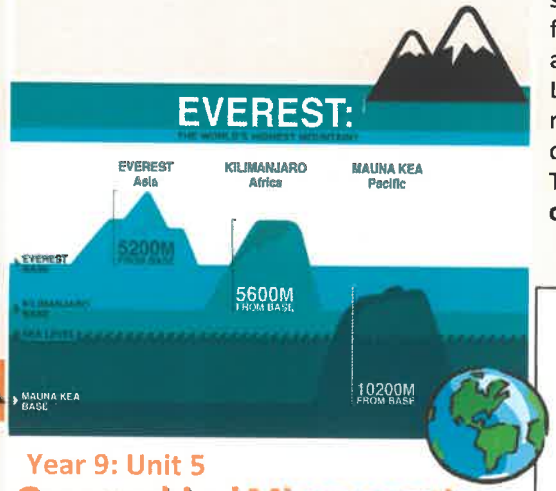
Measuring From the Earth's Centr

Mount Chimborazo, located just one degree south of the Equator where Earth's bulge is greatest. The summit of Chimborazo is 20,564 feet above sea level. However, due to the Earth's bulge, the summit of Chimborazo is over 6,800 feet farther from the centre of the Earth than Everest's peak. **That makes Chimborazo the closest point on Earth to the stars.**



Measuring From Base to Peak

If mountains were measure from base to peak then you may be surprised to learn that Everest is not the tallest mountain on Earth. That honour belongs to **Mauna Kea,** a volcano on the Big Island of Hawaii. Mauna Kea originates deep beneath the Pacific Ocean, and rises more than 33,500 feet from base to peak.



Year 9: Unit 5

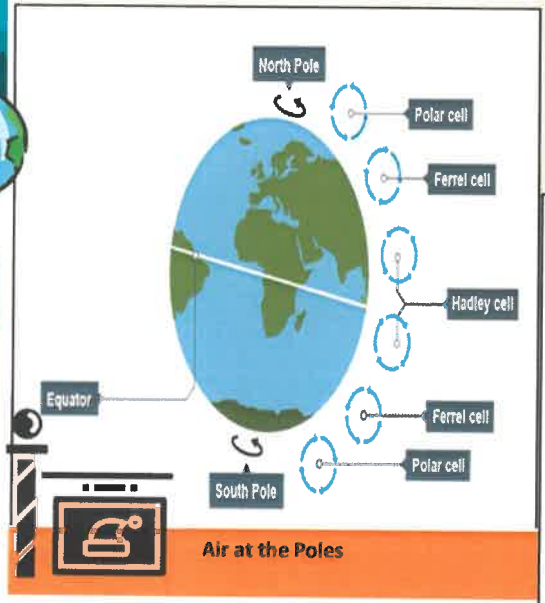
Geographical Misconceptions

Key Words

Landform	A natural feature on the surface of the earth.
Summit	The highest point on a mountain or hill.
Source	Where a river begins.
Tributary	A smaller channel of water that contributes to the main river channel.
Drainage Basin	An area of land that is drained by a river and it tributaries.

It Snows a lot at the North Pole

The movement of air across the planet occurs in a specific pattern. The whole system is driven by the **equator**, which is the hottest part of the Earth. **Air rises at the equator**, leading to **low pressure** and **rainfall**. When the air reaches the edge of the atmosphere, it cannot go any further and so it travels to the north and south. The air becomes colder and denser, and falls, creating high pressure and dry conditions at around 30° north. and south of the equator. Large cells of air are created in this way. Air rises again at around 60° north and south and descends again around 90° north and south. The three cells are the **Hadley cell, the Ferrel cell and the Polar cell.**



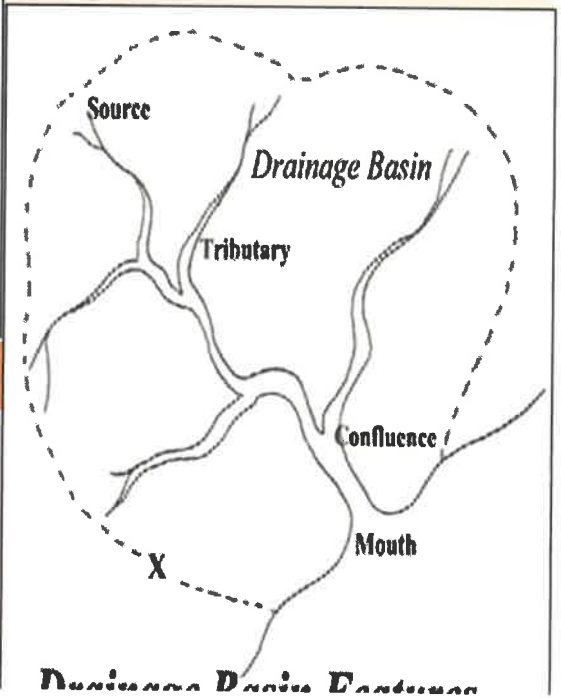
Air at the Poles

At the poles, air is cooled and sinks towards the ground forming **high pressure**, this known as the **Polar high**. This is the reason for little to no precipitation in these regions

The River Nile is the Longest River in the World

Found in **northeast Africa**, the Nile has long been recognised as the **longest river in the world** – stretching a massive **6,695km!** There is some debate over this title, though – some scientists argue that the **Amazon river** in **South America** is longer. The Amazon might also be the world's longest river—depending on whom you ask. Most scientists believe the South American river is at least 4,000 miles (6,400 km) long—still shorter than the Nile. Others, however, have asserted that the **Amazon is actually much longer**. The main problem has to do with the Amazon's start and end points—rather basic elements when determining length.





Drainage Basin Features