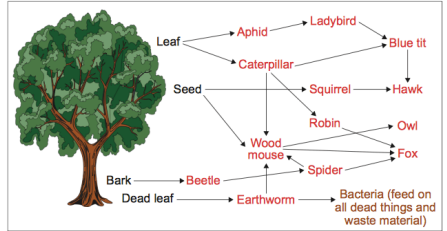
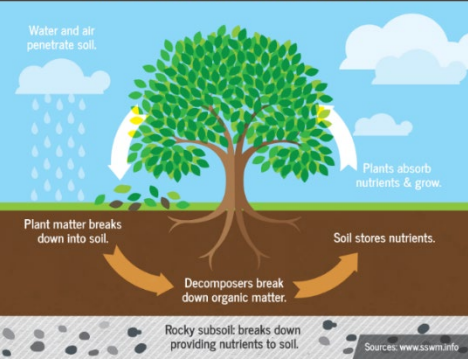


Interactions within an ecosystem

The different parts of the ecosystems interact so it functions effectively. If one part changes, it will effect the whole ecosystem. It includes food chains, food webs and the nutrient cycle.



THE NUTRIENT CYCLE



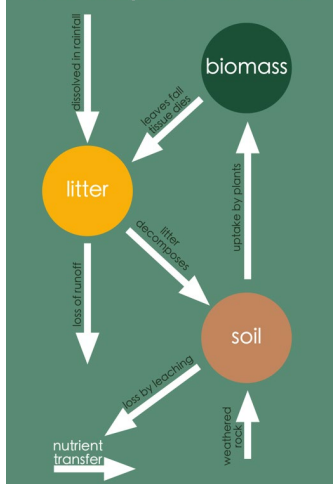
EXAMPLE – Alice Holt - Small scale ecosystem of the UK

Producers	Oak tree, Nettles, Dandelions
Consumers	Aphids, Garden Snail, Caterpillar, Chaffinch
Secondary consumers	Ladybirds, Blue Tit, Robin, Mouse, Hedgehog
Top predators	Fox, Domestic Cat, Sparrow Hawk
Decomposers	Bacteria, fungus
Abiotic	Dead leaves, soil, air, water, sun, stones/rock

Global Ecosystems (Biomes)

Polar – Arctic/Antarctic	Very low temperatures and dry conditions – cold desert – Temperatures can fall below -50°C. Arctic hare, Arctic fox, little vegetation
Tundra – Northern Europe and Canada	Low growing plants adapted to cold, windy and dry conditions. Reindeer, wolves. Ground is frozen for most of the year. Snow.
Boreal Forest – Canada and Scandinavia	Mainly coniferous forests – trees which are evergreen. Pine needles are difficult to decompose so soil has few nutrients. Temperatures may reach 10°C. Moose, wolves, bears.

interdependence



Unit 1: b AQA

The Living World

What is an ecosystem	
An ecosystem is the (biotic) living and (abiotic) non-living parts of an environment and the relationships that exist between them.	
Biotic	Animals, plants, trees, insects, bacteria, fungi
Abiotic	Soil, rock, water, air, sun

Location of global environments

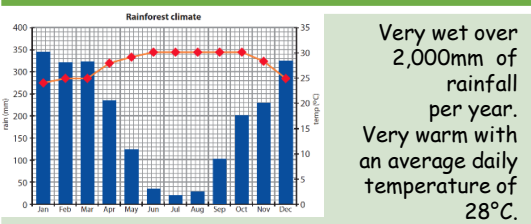
Temperate Deciduous Woodland:
Areas like the UK have a milder climate than you expect at this distance from the Equator. The warmer/cooler currents from the North Atlantic/Pacific Drift Current helps maintain warmer temperatures.

Tropical Rainforests:
In the tropics, the sun's rays are at a high angle in the sky for a whole year. Rays are concentrated over a smaller area than the poles.

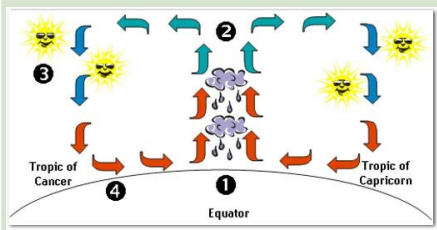
Deserts: Continentality, the effect of distance from the sea, also affects vegetation. Away from the sea, the land heats up in the hot season and cools quickly in the cold season. The increases the annual temperature ranges and reduces precipitation.

The Tundra:
Average temperature is the main factor affecting plant growth. Temperature gradually decreases as you move away from the Equator. As latitude increases, so temperature decreases.

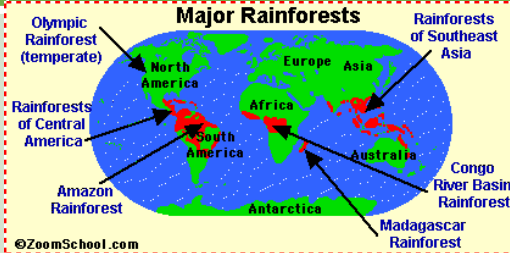
Rainforest climate



Very wet over 2,000mm of rainfall per year. Very warm with an average daily temperature of 28°C.



Distribution of Rainforests



The sun's rays are more intense at the Equator which results in high temperatures and convectional rain caused by evaporation. Rainforests, such as the Amazon, lie near the Equator. This means that the sun's rays are more concentrated in these regions and this produces convectional rain.





Distribution of Hot Deserts and Hot Desert climate

There are four factors which form desert areas:

- The presence of **high pressure**, creating cloud-free conditions
- Cold ocean currents** – which limit evaporation
- Mountain ranges** to create rain shadows
- Continentality** - distance from the sea

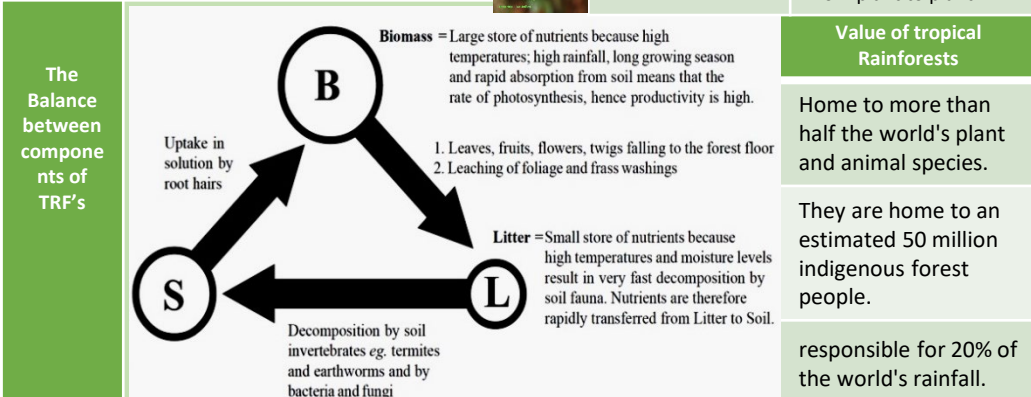
The climate is very **hot**. Summer day time temperatures can exceed 40°C. At night the temperature can drop below 0°C. The climate is very **dry** with less than 250 mm of rainfall a year.

Physical Characteristics of TRF's

Emergent Layer		Tall trees often reaching 50m high. Kapok trees are very fast growing, to compete with other trees to reach the sunlight.
Canopy Layer		A mass of leaves, trees grow quickly to reach the light. The leaves sustain the trees through photosynthesis. The majority of species live here - moist air and presence of flowers, seeds and nuts which sustain the food chain.
Under canopy Layer		It is very dark. Trees are branchless as there is little sunlight for photosynthesis, so it is not worth growing leaves.
Shrub layer		Very dark, poor soils, high humidity

Plant adaptation in TRF's

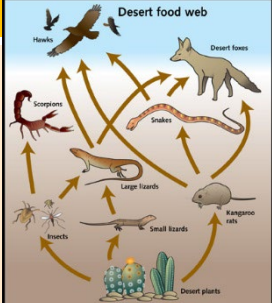
Buttress roots - Massive ridges help them to support large trees. The shallow roots also spread out under the soil to absorb rainwater which quickly evaporates and to take up nutrients from the poor soils.	Drip tips - plants have leaves with pointy tips . This allows water to run off the leaves quickly without damaging or breaking them.	Sloth uses camouflage and moves very slowly to make it difficult for predators to spot.	Flying frog has fully webbed hands and feet , and a flap of loose skin that stretches between its limbs, which allows it to glide from plant to plant.
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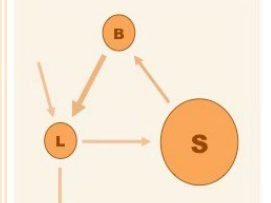
Case Study – Amazon Rainforest (2.6 million square miles, 65% in Brazil)

Causes of deforestation	Impacts of deforestation	Sustainable Management
<ul style="list-style-type: none"> Cattle Ranching (80%) – 200 million cattle Mineral extraction – Gold, iron and copper Energy – Hydroelectric dams Commercial logging – Hardwood e.g. Mahogany \$10,000 per tree! Road building – 4000km Trans Amazonia highway 	<ul style="list-style-type: none"> Loss of species Rainfall could decrease by 12% by 2050 Forests catch CO2, deforestation releases CO2 Loss of nutrients in soils Disruption of the food web Loss of indigenous people's traditional way of life (31% of indigenous lands already logged illegally) 75% reduction in HEP production due to lack of rain 	<p>Eco-tourism this encourages tourism that creates jobs for local people. The money is used to protect and conserve the TRF</p> <p>International agreements to protect TRF's</p> <p>Selective logging of mature trees ensures that the rainforest canopy is preserved.</p>

Food Web




Interactions within hot deserts



DESERT

Conditions:
Hot (cold at night)
Extremely dry

Summary:
Main store = Soil
Slow transfer (due to dryness)



Plant adaptation in TRF's

Succulents Plants which have fleshy stems or bulbs in order to store water Thorns or spikes to stop animals from eating them	Perennial plants Desert perennials often survive by remaining dormant during dry periods of the year, then springing to life when water becomes available.	Physical adaptations <ul style="list-style-type: none"> Second set of eyelashes Storing fat in humps Colour changes 	Behavioural adaptations <ul style="list-style-type: none"> Nocturnal for cooler temperatures Burrowing to avoid hot surface temperatures
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Desertification - causes

Population growth - the population in some desert areas is increasing. In places where there are developments in mining and tourism, people are attracted by jobs.	Planting more trees - the roots of trees hold the soil together and help to reduce soil erosion from wind and rain.
Overgrazing - an increasing population results in larger desert areas being farmed. Sheep, cattle and goats are overgrazing the vegetation. This leaves the soil exposed to erosion	Improving the quality of the soil - this can be managed by reducing the number of grazing animals they have and growing crops instead. The animal manure can be used to fertilise the crops grown.
Climate change - the global climate is getting warmer. In desert regions conditions are not only getting warmer but drier too. On average there is less rain now in desert regions than there was 50 years ago	Water management - water can be stored in earth dams in the wet season and used to irrigate crops during the dry season. This is an example of using appropriate technology to manage water supplies in the desert environment.

Case Study –The Sahara Desert – Morocco

Development Opportunities	Challenges of developing hot deserts
<ul style="list-style-type: none"> Morocco grew 100,000 tonnes of dates Morocco built the largest solar energy plant. The power station on the edge of the Saharan desert will be the size of the country's capital city, and provide electricity for 1.1 million people. Morocco is the largest exporter of mined phosphate – used in fertilisers Tourism such as camel treks, sand boarding in countries such as Morocco – around 12 million people per year. 	<ul style="list-style-type: none"> Water shortages – due to less than 250mm of rain – water is used for cleaning, agriculture and industry Extreme heat – frequently above 40°C and below freezing at night. Too hot for tourists and physical work is difficult Inaccessibility – Roads are covered by shifting sand, or damaged by heavy trucks. 80% of roads in Morocco are in bad condition Lack of infrastructure – pipes, electricity supply and roads